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FINAL PRELIMINARY ASSESSMENT REPORT FOR POTENTIAL RELEASES OF PER AND POLYFLUOROALKYL SUBSTANCES NAS PATUXENT RIVER MD

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CH2M HILL

Final

Preliminary Assessment Report for Potential Releases of Per- and Polyfluoroalkyl Substances (PFAS)

Naval Air Station Patuxent River
St. Mary's County, Maryland

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Executive Summary

The Department of the Navy (DON) is committed to identifying, evaluating, and where appropriate, remediating contamination resulting from its activities, including those relative to emerging contaminants, such as per- and polyfluoroalkyl Substances (PFAS)[1]. The primary DON release of PFAS was through the use of aqueous film forming foam (AFFF) for fire and emergency responses and during test and training activities; however, PFAS may be released to the environment from other activities, including industrial operations (specifically chrome plating) and the storage, handling, or disposal of PFAS containing materials or wastes.

The Navy has proactively developed a policy to ensure drinking water near installations has not been impacted by known or suspected release of PFAS, specifically perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA), for which the EPA has established lifetime health advisory levels. Navy policy is to sample drinking water sources 1 mile down-gradient from a known or suspected release of PFAS, and mitigate the exposure if PFOA/PFOS are detected at levels exceeding the EPA lifetime health advisory levels. The evaluation of the initial areas/sites on NAS Patuxent River identified as having a known or suspected releases was limited to existing Environmental Restoration (ER) sites; these sites were found to have no complete exposure pathway to a potential drinking water source, hence no off-base drinking water sampling was initiated. This evaluation included the review of the site hydrogeologic and hydrologic settings, previous sampling results, and local county records. The Navy policy also identified that installations should conduct a broader investigation to identify additional other locations where PFAS may have been released into the environment, but not reported as a "release" due to the nature of the operational event (i.e. equipment testing or emergency response) and the unknown hazards associated with PFAS at the time of the release.

The purpose of this Preliminary Assessment (PA) is to document the evaluation of NAS Patuxent River ER sites and to identify additional possible environmental releases of PFAS from historic operations at NAS Patuxent River. The PA also prioritizes sites based upon exposure pathways from the releases to environmental media and from environmental media to potential receptors. Sites will progress into the Site Inspection (SI) phase based on the priority assigned in the PA.

In addition to the ER sites previously identified, the objectives of the PA, as identified in the Final Work Plan [*Review of Historical Use of Aqueous Film-Forming Foam and Potential Releases of Perfluorinated Compounds, Naval Air Station Patuxent River, St. Mary's County, Maryland* (CH2M, 2016)], were to:

- Research documented fire training area sites (FTAs) and electroplating shops that may have been impacted by PFAS releases at NAS Patuxent River.
- Gather onsite background data (historical or operational records, incident reports, crash data, and photo interpretation).
- Conduct interviews to identify and document locations (sites) where PFAS releases may have occurred.
- Acquire digital photographs and estimate location coordinates of each site.
- Assess potential source area at, or in the vicinity of each site.
- Evaluate information collected to determine if the site warrants further investigation, including soil, surface water, or groundwater sampling.

Based on the recorded history of releases and gathered information at these sites, nine high priority sites were identified that were likely impacted by PFAS from the release of AFFF. Additionally, three medium priority sites were identified that may have been impacted. The sources of the PFAS at high and medium sites were associated with fire training, daily equipment check areas, demonstrations, AFFF systems, or AFFF storage. Sampling of environmental media conducted as part of SIs is recommended at all high and medium priority sites (**Table 1**). It is recommended that SIs are tailored to each site based upon the approximate location of the reported release, quantity released, and nature of the release.

Additionally, four sites with uncertainty due to the timing and quantity of AFFF released and one-time PFAS releases of AFFF foam from crash trucks were given low priority (**Table 1**). Impact to environmental media at these sites are estimated to be minimal for multiple reasons: majority of the releases occurred over 25 years ago, diluted AFFF foam was released instead of AFFF concentrate, crash truck response was to limit spatial areas, and releases were single incidents over short periods of time. The impact may be minimal but is still unknown at this time; therefore, sampling is recommended at low priority sites to determine if PFAS may be present at these sites.

Finally, there are 32 sites that were examined and found to have little likelihood of PFAS releases (**Table 1).** Other release mechanisms for PFAS releases associated with plating operations and waste disposal areas were designated No Action Sites because the information gathered during interviews and follow-on document research, showed no AFFF storage or system, no reported use of PFAS material or mist suppressant, and no release of PFAS to the environment. No action is recommended at these 32 sites.

Contents

Appendices

Tables

Figures

Acronyms and Abbreviations

AIMD	Aircraft Intermediate Maintenance Department
AFFF	Aqueous Film Foaming Foams
amsl	above mean sea level
Baker	Baker Environmental, Inc.
bgs	below ground surface
CH2M	CH2M HILL, Inc.
CLEAN	Navy Comprehensive Long-Term Environmental Action Navy
DoD	Department of Defense
ECF	electrochemical fluorination
ER	Environmental Restoration
FTA	fire training area
gpd	gallons per day
INFADS	Internet Navy Facilities Asset Data Store
JP	jet propulsion
MAD	Marine Aviation Detachment
MDE	Maryland Department of the Environment
METCOM	St. Mary's County Metropolitan Commission
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NAWCAD	Naval Air Warfare Center Aircraft Division
PA	Preliminary Assessment
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutane sulfonic acid
PFHpA	perfluoroheptanoic acid
PFHxS	perfluorohexane sulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PHR	Pine Hill Run
PWS	public water system
RDT&E	Research, Development, Training, and Evaluation
RI	remedial investigation
ROD	Record of Decision
SI	Site Inspection
TPS	Test Pilot School
USGS	United States Geological Survey
UST	underground storage tank
USEPA	United States Environmental Protection Agency
WWTP	wastewater treatment plant

SECTION 1

Introduction

This Preliminary Assessment (PA) report presents the data and findings obtained to identify additional possible environmental releases of per- and polyfluoroalkyl substances (PFAS) from historic operations at Naval Air Station (NAS) Patuxent River (also referred to as the Station). As part of the PA. CH2M HILL, Inc. (CH2M) collected information on possible aqueous film forming foams (AFFF) or PFAS sites documented within the Administrative Record for NAS Patuxent River. To verify the historical information and fill data gaps, CH2M conducted interviews and field visits at NAS Patuxent River during the weeks of September 26, 2016, January 16, 2017, and March 20, 2017.

NAS Patuxent River is in St. Mary's County, Maryland approximately 65 miles southeast of Washington, D.C. (**Figure 1**). The NAS Patuxent River was listed on the National Priorities List on June 30, 1994 under United States Environmental Protection Agency (USEPA) Identification Number MD7170024536.

1.1 Background

PFAS are fluorinated synthetic organic chemicals whose unique water-and oil-repelling properties make them commercially valuable. PFAS have unique surfactant properties that make them repel both water and oil. For many years, PFAS have been used in industrial applications and consumer products to make them more stain-resistant, waterproof, and/or nonstick. They are used in such products as carpeting, apparels, upholstery, food packaging, non-stick cookware, AFFF, and certain types of metal plating. Although PFAS are not found naturally in the environment, they have been found both in the environment and in almost all human blood samples collected worldwide. They are considered emerging contaminants (Navy, 2014a). PFAS are persistent, with long carbon chains having half-lives ranging between 2 and 9 years in the body (Agency for Toxic Substances and Disease Registry, 2017). The properties of PFAS in AFFF let them flow across burning petroleum, allowing water to form a layer on top of burning debris or liquid petroleum, making them very effective at fire suppression.

The PFAS compounds used in AFFF historically have been manufactured by two processes: electrochemical fluorination (ECF) and telomerization (telomers) (Buck, et al., 2011). The ECF-based process creates perfluorooctane sulfonate (PFOS), which is persistent and bio-accumulative. The telomer process does not create PFOS; however, the USEPA has indicated that some telomer-based fluorochemicals can break down in the environment into perfluorooctanoic acid (PFOA), which is also persistent and bioaccumulative (Buck, et al., 2011).

In 1969, the Department of Defense (DoD) issued military specification MIL-F-24385, which includes the requirements for AFFF . Since the 1960s, AFFF meeting the MIL-F-24385 specification was developed by seven manufacturers - 3M, Ansul, National Foam, Angus, Chemguard, Buckeye, and Fire Service Plus, Inc. Military installations, airports, oil refineries, and firefighting training facilities throughout the U.S. have been using AFFF to extinguish fuel related fires.

Although the largest manufacturer of PFOS-based AFFF, 3M Company, voluntarily stopped manufacturing PFOS chemicals in 2002; other countries still produce PFOS and PFOA containing materials and they can be imported into the U.S. in limited quantities (ASTDR, 2016). In 2006, EPA and eight major companies in the PFAS industry launched the 2010/2015 PFOA Stewardship Program where companies worked to stop producing PFOA and related chemicals from emissions and in their products by 2015. Companies in this program included Arkema, Asahi, BASF Corporation, Clariant, Daikin, 3M/Dyneon, DuPont, and Solvay Solexi (ASTDR, 2016 and USEPA, 2017a). According to USEPA, all participating companies stated that they met the program goals (USEPA, 2017a) and current production of PFAS containing substances has largely ceased in the U.S. with a few exceptions for limited industrial uses (USEPA, 2017b).

Many facilities within DoD, including NAS Patuxent River, maintain inventories of PFOS-based AFFF. When AFFF has been used for fire training, equipment checks, and demonstrations or had large or repeated releases over time, PFAS can migrate into the soil and leach into groundwater. The amount of PFAS that enters groundwater depends on the type and amount of AFFF used, where it was used, the type of soil, and other factors. Sampling

data collected from historical fire training areas (FTAs) by the DoD confirm that most fire training areas have PFAS in groundwater (Rak and Vogel, 2009; Porter, 2011).

Understanding of the health and environmental effects surrounding environmental PFAS exposure is still evolving. Much research has been and is being done in the U.S. and internationally. In general, PFAS are persistent and bio-accumulative substances that do not metabolize in humans and stay in the body for long periods of time. As a result, as people are exposed to PFAS from different sources over time, the level of PFAS in their bodies may increase. USEPA has established health advisories for PFOS and PFOA to provide Americans, including sensitive populations, with a margin of protection from a lifetime of exposure to PFOS and PFOA in drinking water (USEPA, 2016a). The USEPA Lifetime Drinking Water Health Advisory Level is 70 parts per trillion (ppt) for PFOS and 70 ppt for PFOA. When both PFOS and PFOA are detected in drinking water, the combined concentration should not exceed 70 ppt. USEPA also has established a regional screening level for perfluorobutane sulfonic acid (PFBS) in tap water is 400 parts per billion (ppb) based on a hazard quotient of 1. There are currently no legally enforceable federal or Maryland standards for PFAS constituents; however, some states do have standards or guidance levels for various PFAS compounds in groundwater and drinking water.

In October 2014, the Assistant Secretary of the Navy, Energy, Installations and Environment issued a policy requiring identification of sites with the potential for PFAS contamination and required that all Unregulated Contaminant Monitoring Rule (UCMR3) testing and reporting requirements were met by December 2015. In addition, this policy required installations note required to test under the UCMR3, and where the installation produced drinking water from on-installation sources to sample the finished drinking water by December 2015, for PFOS and PFOA where an identified or suspected PFAS release was within one-mile upgradient of the drinking water source (Navy, 2014a). In June 2016, the Navy Office of the Assistant Secretary for Energy, Installations and Environment issued policy requiring the sampling of finished drinking water on all installations by November 15, 2016, where sampling was not already completed under Navy policy or where water was purchased from a public water system that had not already completed testing for PFAS.

1.2 Purpose and Objectives

The purpose of this Preliminary Assessment (PA) is to document the evaluation of NAS Patuxent River ER sites and to identify additional possible environmental releases of PFAS from historic operations at NAS Patuxent River. Sites will progress into the Site Inspection (SI) phase based on the priority assigned in the PA.

In addition to the ER sites previously identified, the objectives of the PA, as identified in the Final Work Plan [*Review of Historical Use of Aqueous Film-Forming Foam and Potential Releases of Perfluorinated Compounds, Naval Air Station Patuxent River, St. Mary's County, Maryland* (CH2M, 2016)], were to:

- Research documented FTAs and electroplating shops that may have been impacted by PFAS releases at NAS Patuxent River.
- Gather onsite background data (historical or operational records, incident reports, crash data, and photo interpretation).
- Conduct interviews to identify and document locations (sites) where PFAS releases may have occurred.
- Acquire digital photographs and estimate location coordinates of each site.
- Assess potential source area at, or in the vicinity of each site.
- Evaluate information collected to determine if the site warrants further investigation, including soil, surface water, or groundwater sampling.

This PA outlines the approach taken to achieve the listed objectives and provides conclusions pertaining to the data collected and recommendations for SIs. This report was prepared for Naval Facilities Engineering Command (NAVFAC) Washington, under the Comprehensive Long-term Environmental Action— Navy (CLEAN) 8012, Contract N62470-11-D-8012, Contract Task Order JU43, for submittal to NAVFAC Washington, the USEPA Region III, and the Maryland Department of Environmental (MDE).

1.3 Basewide Environmental Setting

Descriptions of the geology, hydrogeologic setting, and the ecological receptors are presented in the sections below.

1.3.1 Geology

NAS Patuxent River is in the Coastal Plain physiographic province, approximately 50 miles southeast of the Piedmont physiographic province. The Coastal Plain sediments consist of a thick sequence of unconsolidated sand, clay and gravel that dips gently (less than 1 degree) to the east and southeast (Fred C. Hart and Associates, 1984). The thickness of the sedimentary units varies from approximately 2,000 feet in the northwestern part of St. Mary's County to 3,000 feet in the southeastern area of the county. Near NAS Patuxent River, the unconsolidated Coastal Plain sediments overlie crystalline rocks.

1.3.2 Hydrogeologic Setting

The regional hydrogeological system of the Coastal Plain near the NAS Patuxent River consists of several aquifers within the geologic units previously discussed. From shallowest to deepest, the aquifers of primary interest with respect to the NAS Patuxent River are the surficial aquifer, the Piney Point- Nanjemoy aquifer, the Aquia aquifer, and the Patapsco aquifer. The surficial (water table) aquifer, the shallowest aquifer beneath NAS Patuxent River, occurs in the Lowland deposits (i.e., clay, silt, sand and gravel), unconfined, and ranges in thickness from 10 to 100 feet (USGS, 2007). The St. Mary's Formation, as one formation of the low-permeability Chesapeake Group, functions primarily as a confining unit underlying the surficial aquifer. This confining unit is approximately 210 to 250 feet thick (USGS, 2007). The Piney Point-Nanjemoy, Aquia, and Upper Patapsco aquifers are deeper, confined aquifers below the St. Mary's Formation (Fred C. Hart Associates, 1984). The Aquia and Patapsco aquifers are the primary source of potable water for NAS Patuxent River and surrounding areas (Klohe and Feehley, 2001).

Groundwater from the surficial aquifer discharges to surface water bodies, including ponds, streams, the Patuxent River, and the Chesapeake Bay. Groundwater flow from the surficial aquifer across the Station is predominately towards the Patuxent River and the Chesapeake Bay and away from Station residences and businesses. The surficial aquifer is recharged by precipitation and infiltration. The surficial aquifer is not used by NAS Patuxent River nor has it been permitted for drinking water use by St. Mary's County Health Department since 1976 (Rose, 1998).

Water for drinking and industrial use at NAS Patuxent River is obtained from groundwater withdrawals from 24 production wells across the Station. Nineteen of the wells are installed in the Aquia aquifer with intake depths greater than 500 feet. Four of the wells are in the shallower Piney Point-Nanjemoy aquifer with intake depths between 284 to 357 feet. Finally, one production well is installed in the Upper Patapsco aquifer at a depth greater than 900 feet. The production wells are used by the Station in one of two ways, as either independent supply or community supply. Independent supply wells only provide water to one or two buildings at or adjacent to the production well location. Community supply wells are separated into three zones (Zones A, B, and C) and are all connected to the main water supply for the Station. Wells in the three zones can all be connected or isolated by valves to supply water. The Station has 18 community supply wells and 6 independent supply wells. Locations of these wells about the PFAS sites are shown on **Figure 2A**.

1.3.3 Hydrologic Setting

The Patuxent River Basin occupies approximately 930 square miles and receives drainage from seven counties in Maryland. Near NAS Patuxent River, the river is estuarine, so tidal action overrides stream flow and is a major influence on river stage and stream velocity. The drainage divide between the Potomac River and Patuxent River closely follows Route 235, which borders NAS Patuxent River to the southwest. Most streams draining Patuxent River originate on the northeast side of Route 235 and drain into NAS Patuxent River. Streams that originate on NAS Patuxent River stay within the Station boundaries until draining directly or indirectly into Patuxent River or the Chesapeake Bay.

Surface drainage on the Station is to short streams that dissect the upland plateau. The streams occupy small valleys that descend rapidly toward the Patuxent River and the Chesapeake Bay. Flow in these streams typically is

intermittent, but several have continuous flow and discharge into ponds, the Patuxent River, or the Chesapeake Bay. The largest stream on the Station is Pine Hill Run (PHR), which flows along the Station of the upland plateau. Both upland and lowland habitats drain the PHR, which is shallow and drains toward the Chesapeake Bay (Fred C. Hart and Associates, Inc., 1984).

1.3.4 Human Receptors

For the general population, human receptors include any users of drinking water on or off the base with ingestion considered the major exposure pathway. Migration pathways to drinking water sources include:

- Direct releases of PFAS to surface and/or subsurface soil leading to leaching of PFAS to groundwater;
- Direct releases of PFAS to surface water pathways through stormwater conveyances leading to water bodies used for drinking water; and
- Transport via advection with groundwater flow to areas downgradient of PFAS source areas.

The rates of migration of individual PFAS compounds to possible human health receptors from source areas can vary based on their affinity for each environmental media (i.e., air, soil, surface water, groundwater). PFAS are very water soluble so can be transported long distances in surface water and groundwater depending on sorption to sediments and soils. Although PFAS have a low volatility, they can be transported over long distances in the atmosphere with fugitive dust particles; however, compared to data on ingestion the exposure pathway from dust particulates is unclear. Receptors through the ingestion exposure pathway are found within the boundary of the Station through the 18 community supply wells across the Station; however, there is no current exposure from releases of PFAS to these receptors based on the hydrogeologic setting discussed in Section 2.3. UCMR3 monitoring did not indicate a transport pathway into the deeper Piney Point-Nanjemoy and Aquia aquifers used for the supply wells from the surficial aquifer. The migration pathway to receptors found adjacent to and off the base boundary through private water supply wells does not appear to be complete based on surface water and groundwater flow. Flow direction for these two media are away from the private communities located on the west and south sides of the Station and flow direction is towards the Patuxent River and Chesapeake Bay to the north and east.

1.3.5 Ecological Receptors

Ecological receptors include any living organism other than humans, the habitats that support those organisms or the natural resources that could be adversely affected by environmental contaminates resulting from a release at or mitigation from a site. Ecological receptors are found within and adjacent to the boundary of the Station.

Within the boundaries of NAS Patuxent River, wetlands, vegetative communities and aquatic and terrestrial habitats are present. On NAS Patuxent River, the wetlands and transitional areas between aquatic and terrestrial habitat types are flooded and/or saturate near the ground surface for extended periods of time. Physical, chemical, and biological features indicative of the hydrological conditions characterized these areas. Per the large-scale wetland delineation at NAS Patuxent River conducted in 1995, the wetland areas include forested wetlands, scrub/shrub wetlands, saline marshes, freshwater tidal marshes, nontidal marshes, and open water/emergent wetlands (Navy, 2014b).

Several types of vegetative communities/habitats are found on NAS Patuxent River including, forests, agricultural field, old fields, marshes and other aquatic communities, and scrub/shrub areas. No federally listed threatened or endangered plant species are known to occur on NAS Patuxent River, but several state-listed species have been found.

Various aquatic and terrestrial habitat types can be found supporting fish and wildlife. Some of the more familiar animals include the white-tailed deer (*Odocoileus virginianus*), gray squirrel (*Sciurus carolinensis*), eastern cottontail (*Sylvilagus floridanus*), red fox (*Vulpes vulpes*), muskrat (*Ondatra zibethicus*), river otter (*Lontra canadensis*), mink (*Mustela vison*), beaver (*Castor cancadensis*), northern bobwhite (*Colinus virginianus*), mourning dove (*Zenada macroura*), and the american woodcock (*Scolopax minor*). Rare species of wildlife, including state and federally listed threatened or endangered species are known to occur on NAS Patuxent River.

Specific details on ecological receptors, habitats and terrestrial and aquatic wildlife at NAS Patuxent River are provided in the 2014 *Integrated Natural Resources Management Plan Annex III-B and Appendix C* (Navy, 2014b).

1.4 The Third Unregulated Contaminant Monitoring Rule (UCMR3)

The 1996 Safe Drinking Water Act amendments require that once every 5 years USEPA issue a new list of no more than 30 unregulated contaminants to be monitored by public water systems (PWSs). The Third Rule (i.e., UCMR3) was published in May 2012 and sampling took place between 2013 and 2015 and included monitoring for 28 chemicals and 2 viruses using analytical methods developed by USEPA. This provides USEPA and other interested parties with data on the occurrence of unregulated contaminants in drinking water. As part of the UCMR3 monitoring, PWSs serving more than 10,000 people (i.e., large systems) and 800 representative PWSs serving 10,000 or fewer people (i.e., small systems) included the analysis of the following six PFAS compounds PFOS, PFOA, PFBS, perfluorononanoic acid [PFNA], perfluorohexane sulfonic acid [PFHxS], and perfluoroheptanoic acid [PFHpA] (USEPA, 2016b).

PWSs at NAS Patuxent River and adjacent Lexington Park were included the UCMR3 monitoring. In December 2014 and June 2015, 15 of the 24 production water wells used in the PWS network at NAS Patuxent River were sampled under the UCMR3; the results were non-detect for the six PFAS compounds in all samples. According to Station personnel, the other nine water wells do not meet the criteria as PWS wells; therefore, were not sampled as part of UCMR3. In addition, three PWS wells in Lexington Park were also sampled in 2015. The results were also non-detect for the six PFAS compounds. A complete list of the wells sampled under the UCMR3 Study is provided in **Appendix A**.

1.5 Report Organization

This PA Report is organized as follows:

- **Section 1, Introduction**, provides a project overview and environmental setting of NAS Patuxent River, and previous UCMR3 sampling results collected from NAS Patuxent River.
- **Section 2, Preliminary Assessment Methods**, describes the process used to identify sites at NAS Patuxent River where AFFF storage and PFAS have been released.
- **Section 3, High Priority Sites,** describes sites that are known FTAs, daily equipment-check areas, demonstration areas, or has an AFFF system, identified as having had larger releases of AFFF foam or AFFF concentrate or known to have impacted environmental media.
- **Section 4, Medium Priority Sites,** describes sites with an AFFF system and has had several moderate releases of AFFF concentrate that were either captured by a recovered system or cleaned up but still may have impacted environmental media.
- **Section 5, Low Priority Sites,** describes sites with uncertainty due to the timing and quantity of AFFF released and one-time releases of AFFF foam from crash trucks. However, impact to environmental media at these sites are estimated to be minimal for multiple reasons: majority of the releases occurred over 25 years ago, diluted AFFF foam was released instead of AFFF concentrate, crash truck response was to limit spatial areas, and releases were single incidents over short periods of time.
- **Section 6, No action sites,** describes sites with no known use of AFFF or release of PFAS. Sites may have an AFFF system but have not had any known releases. Sites may have been identified in the initial site inventory but determined not to have had a release.
- **Section 7, Conclusions and Recommendations,** summarizes and provides conclusions and recommendations for all sites.
- **Section 8, References,** lists the references cited in this report.

In addition, the following support information is appended to this report:

- **Appendix A,** UCMR3 Results for NAS Patuxent River
- **Appendix B,** Completed Questionnaires
- **Appendix C,** Photo Documentation

SECTION 2

Preliminary Assessment Methods

2.1 Site Selection and Rationale

The PA is a review of potential PFAS release mechanisms with a primary focus on the historical use of AFFF and potential release of PFAS at NAS Patuxent River to distinguish between the potential magnitude of PFAS releases. The PA included preliminary and follow-on desktop document research, interviews with key personnel at NAS Patuxent River, and a field information collection effort, conducted during site visits.

An initial list of sites and areas with potential storage of AFFF and releases of PFAS at NAS Patuxent River were identified during the preliminary desktop document research effort; the list was provided in the Work Plan (CH2M, 2016) and guided the initial phase of the PA.

Documents reviewed include:

- Remedial Investigations (RIs)
- Historian records
- Decision Documents
- Basewide Preliminary Assessment (PA) or Desktop Evaluations;
- Historical photo analysis
- Record of Decisions (RODs)
- Spill logs/Incidental Reports/ Release Reports
- Operational Records
- Aircraft crash reports
- AFFF purchase receipts
- Site Inspection Reports
- Results of UCMR3 sampling

Interviews and site visits were conducted to gather additional information not available in documents. Prior to the interviews a questionnaire was sent to Station personnel with specific or anecdotal knowledge of AFFF usage, including but not limited to active and retired Fire Fighters and Fire Chiefs, building and hangar representatives at structures with AFFF fire suppression systems, Fire Suppression/AFFF technicians, the Spill Response Manager, the Natural Resource Manager, and the Hazardous Waste Manager. After questionnaires were received and reviewed, interviews were conducted to gather any additional anecdotal information that may assist in the identification of AFFF releases or any release of PFAS containing materials or wastes to the environment from storage, handling, or disposal and industrial operations such as chrome plating. Completed questionnaires, excluding personal information, are provided in **Appendix B**.

In March 2017, field visits were conducted to assess site-specific conditions at sites tentatively categorized as having medium to large releases. During these visits, the environmental setting (including the composure of the ground surface, visual evidence of past practices and operations and potential transport pathways) were recorded. Where permitted, the field team entered AFFF mechanical rooms to observe the system specifications and configuration and took photographs, when permitted. Photo documentation is provided in **Appendix C**.

2.2 Site Prioritization

Based on the results of the document reviews, interviews, and field visits, the preliminary list of potential PFAS sites was updated and prioritized. The criteria used for prioritization is defined below and was based upon multiple criteria playing an impact on environmental media at each site, including years of operation, frequency, size, and type of the releases, and if contained to impermeable areas or capture by a recovery system. The prioritization process separated the sites recommended for SIs (high, medium, and low priority) from sites

recommended for no action. The site prioritization will be used to assist with prioritizing of funding for future SIs for the sites. High priority sites will receive funding first followed by medium and low sites.

Table 1 summarizes the findings from this PA report and presents the rationale and prioritization of potential PFAS sites. The identified sites are prioritized in **Table 1** as follows:

- **High Priority** - Known FTAs, daily equipment-check areas, demonstration areas, or has an AFFF system, identified as having had larger releases, identified as having larger releases of AFFF foam or AFFF concentrate or known to have impacted environmental media.
- **Medium Priority** - Sites with an AFFF system and has had several moderate releases of AFFF concentrate that were either captured by a recovery system or cleaned up but still may have impacted environmental media.
- **Low Priority** – Sites with uncertainty due to the timing and/or quantity of AFFF released and one-time releases of AFFF foam from crash trucks. However, impact to environmental media at these sites are estimated to be minimal for multiple reasons: majority of the releases occurred over 25 years ago, diluted AFFF foam was released instead of AFFF concentrate, crash truck response was to limit spatial areas, and releases were single incidents for short periods of time.
- **No Action** - Sites with no known use of AFFF or release of PFAS. Sites may have an AFFF system but have not had any known releases.

The locations of the High, Medium, and Low Priority sites are presented on **Figure 2A** and the locations of the No Action sites are presented on **Figure 2B**.

2.3 Human Health Exposure Assessment

There is no current complete exposure pathway to people from releases of PFAS to on or off base receptors. This is based partially upon the UCMR3 monitoring results from 2014 and 2015. A review of the 24 production wells across the Station indicates total well depths ranging from 284 to 900 feet below ground surface (bgs). These wells are all within the Piney Point-Nanjemoy aquifer or deeper Aquia aquifer and not within the surficial aquifer ranging from 10-100 feet bgs. Additionally, the hydrogeologic setting does not indicate a transport pathway into the deeper Piney Point-Nanjemoy and Aquia aquifers from the surficial aquifer because of the thickness of the clays and silts of the Chesapeake Group confining unit which is approximately 210 to 250 feet thick at the Station (USGS, 2007). Because of the tendency of the clays of the confining unit to swell around any grouted well casing, even water supply wells drilled straight through the Chesapeake Group confining unit would not likely enable downward migration of PFAS into the deeper aquifer units as indicated with the UCMR3 monitoring results. However, given the poor quality and yield of the surficial aquifer, the surficial aquifer in St. Mary's County has been prohibited to be used for drinking water since 1976 (Rose, 1998). The surficial aquifer is hydraulically connected to surface water that eventually discharge to the Patuxent River or the Chesapeake Bay. If the shallow aquifer is impacted by PFAS, it is assumed that any direct contact by receptors in the surface water bodies would be of minimum due to mixing.

2.4 Environmental Media Hazard Assessment

Once the sites were prioritized, exposure pathways from the releases to environmental media and from environmental media to potential receptor(s) were identified. Release mechanisms resulting in media exposure for receptors may include direct releases from surface runoff leading to soil and potential uptake of contaminants by plants and animals, and the emission of soil contaminants into the air in association with dust particles.

A complete exposure pathway typically includes the following components: a source of contamination, an exposure mechanism by which a receptor comes into contact, and a route of intake for the contaminant into the receptor's body at the exposure point. If any of these elements is missing, the pathway is considered incomplete.

TABLE 1
PFAS Site Summaries, Rationale, and Prioritization
NAS Patuxent River, Maryland

Site Name/ Location	Description	Rationale	Recommendation
		High Priority Sites	
Site 14 – Old Fire Fighting Burn Pad (associated with UST-4 Centerfield Thrust Stand)	Old Fire Fighting Burn Pad, South of Runway 6-24 and North of Taxiway Alpha	• In use from late 1950s through early 1980s (AFFF use from 1970 to early 1980s) • Fires were ignited on concrete pad or in a pit using a fuel • AFFF foam used to extinguish and allowed to infiltrate into the ground and discharge to surrounding stormwater ditches and drains • Unknown amount of AFFF released	Site Inspection
Air Show Fire-Fighting Demonstration Area	Center Airfield South and Southwest of VTOL Pad	• Used for fire-fighting demonstrations during air shows starting in the early 1960s and ending in early 1970s • Protein foam used prior to 1970 followed by AFFF foam from approximately 1970-1973. • Fires were created by dumping fuel around a fuselage to simulate an actual crash scene • AFFF foam on crash trucks used to extinguish and allowed to infiltrate into the ground and discharge to surrounding stormwater ditches and drains; the amount of AFFF foam released is unknown	Site Inspection
Site 41 – Fire Fighting Burn Pad	Former Fire Training Area, Former Building 2128	• Training from 1952 to 1991 • Pipes carried expired JP fuel or waste oil to an old fuselage set in a 200 x 200-ft pit on a concrete pad • Fires were ignited and before 1972, protein based foam was used followed by AFFF foam to extinguish fires • AFFF was allowed to infiltrate into the ground and discharge to surrounding stormwater ditches and drains • Unknown amount of AFFF foam released	Site Inspection
Crash Trucks Daily Equipment Functioning Inspection Area	Taxiway Alpha-Taxiway Bravo, adjacent to old wash rack (Bldg. 1337)	• Crash trucks from Bldg. 103 used this area for daily checks of AFFF spray equipment and consistency of foam • AFFF foam was allowed to infiltrate into the ground and discharge to surrounding stormwater ditches and drains • Unknown amount of AFFF foam released and period over which functioning testing was conducted is unknown	Site Inspection
Building 103 – Air Operations Fire Station	Fire Station 1 – Air Operations Fire Station (Aviation Crash Response)	• Fire station in use since the 1940s for response to any incidents involving air operations • Crash trucks are parked and maintained here • 1,700 gallons of AFFF concentrate is stored in tanks and crash trucks • Daily equipment checks and foam spray testing along with spills and leaks of AFFF concentrate potentially occurred here • Unknown amount of AFFF foam released	Site Inspection

TABLE 1
PFAS Site Summaries, Rationale, and Prioritization
NAS Patuxent River, Maryland

Site Name/Location	Description	Rationale	Recommendation
Building 2385	Hazardous Materials Storage Facility (HAZMART)	• Multiple releases of AFFF concentrate from the suppression system in the building; March 2016: 10-gallon release • A release of 50 gallons in May 2013 traveled through the parking lot and infiltrated into the ground through surrounding stormwater ditches and drains • Other releases were reportedly confined to the cobble area beneath the test connection valves • The total amount of AFFF concentrate released during incidents is estimated to be under 80 gallons	Site Inspection
Hangar 110	Test Pilot School Aircraft Hangar	• April 2015, contents of a 2,200-gallon tank of AFFF concentrate for the suppression system was released due to mechanical failure • No one observed the release and the transport pathway is unclear, but AFFF concentrate was visibly seeping through the concrete and ponding in the adjacent stairwell/walkway area in between hangar bays. • One other small spill was reported in December 2014 and cleaned up (5 gallons) • AFFF suppression system is currently not operational	Site Inspection
Hangar 2133	Joint Strike Fighter Aircraft Hangar, Air Test and Evaluation Squadron 23 (VX-23)	• Multiple releases of AFFF in 2002, 2005, and 2010 from suppression system in the hangar • In at least one incident (date unknown) the entire system inadvertently went off • Exact quantities of AFFF concentrate and foam are unknown • Unknown amount of AFFF foam during the 2010 release entered the sanitary sewer leading to METCOM facility via the bypass valve of the oil/water separator. METCOM had to shut off sewage flow and deal with reactivated AFFF in all the aeration basins. This incapacitated the treatment facility. • AFFF has also been said to be pushed out the hangar onto the grassy area southeast of the concrete apron • On at least two occasions (dates unknown) AFFF could be seen down the storm culvert leading to the drainage ditch near Hangar 115 & Site 55	Site Inspection
Hangar 2835 - Tension Fabric Hangar	NC-130 Test Aircraft Hangar, Air Test and Evaluation Squadron 20 (VX-20), Same location as closed ER Site 29	• A temporary hangar with a AFFF suppression system • Several releases of AFFF foam and concentration in 2012-2015 due to spills, mechanical rupture in cold weather, and inadvertent activation of the system • Date of spills and quantity are: January 2014: 40 gallons; February 2015, 15 gallons; October 2015: 80 gallons	Site Inspection

TABLE 1
PFAS Site Summaries, Rationale, and Prioritization
NAS Patuxent River, Maryland

Site Name/Location	Description	Rationale	Recommendation
		Medium Priority Sites	
Building 1669	"Hush House" Aircraft Engine Test Cell	• Building with AFFF suppression system • An unknown amount of AFFF concentrate was released prior to 1991 and spilled on the ground southeast of the building. The soil was reportedly excavated and disposed. • A release of 500-gallon at most occurred in mid-2000s. This release reportedly went to an oil-water separator which leads to METCOM.	Site Inspection
Hangar 2805	Presidential Helicopter Hangar	• November 2009, 400 gallons of AFFF concentrate was released due to mechanical failure of the suppression system • Recovery system did not work properly and the 2009 release had to be manually contained. Subsequently, recovery system has been repaired • Two other spills were reported in 2014 (40 gallons) and 2015 (15 gallons) and successfully diverted to the recovery system (a 900-ft long, 4-ft diameter underground pipe or UST)	Site Inspection
Hangar 2905	Aircraft Prototype Facility & Hangar	• Hangar with a AFFF suppression system • One release in 2011 of 150 gallons went to the floor drain connected to the sanitary sewer leading to METCOM • A similar release of 150 gallons in November 2015 was confined to the system mechanical room and was stopped from going down the drain. Leaks possibly went outside the mechanical room. • The total amount of AFFF released for all the incidents is estimated to be below 300 gallons	Site Inspection
		Low Priority Sites	
Buildings 215 and 217	Engine Test Area	• First known emergency use of AFFF occurred here in December 1970 • Engines of a F-8 aircraft were being tested and the plane caught on fire • Firefighters sprayed AFFF to extinguish the fire; amount of AFFF used unknown	Site Inspection
Building 102	Former Fire Station 2 Currently, Marine Aviation Detachment	• Former fire station in the 1960s-1970s, mostly used for structural fires, not aircraft crashes • Powdered protein foam was used • Historical photo showed crash truck discharging what is likely AFFF for a demonstration; amount of fire-fighting agent used unknown • Historical photo showed protein foam sprayed on conex box from a portable extinguisher cart for a demonstration; amount of protein foam used unknown	Site Inspection

TABLE 1
PFAS Site Summaries, Rationale, and Prioritization
NAS Patuxent River, Maryland

Site Name/Location	Description	Rationale	Recommendation
Building 840 - Skeet Range, Aircraft Crash Site	Aircraft Crash near Skeet Range	• T-38A Talon aircraft crash in July 2000 • Firefighters responded using AFFF to extinguish the fire; amount of AFFF used unknown • Additionally, an A-37 aircraft crashed on the skeet range before 1991 (exact date unknown) and AFFF was used on the crash; amount of AFFF used unknown	Site Inspection
Bronson Road - Aircraft Crash Site	Aircraft Crash near Bronson Road, West of 2805	• F/A-18 Hornet crash in 1992 • Firefighters responded using crash trucks and sprayed AFFF to extinguish the fire; amount of AFFF used unknown	Site Inspection
		No Action Sites	
Site 3	Disposal Site near Goose Creek and Closed ER site	• Site was used during 1959 and 1960 as solid waste disposal site for Base (pre-dates use of AFFF at the Base) • Non-Time Critical Removal Action (NTCRA) completed in 2014 removed approximately 8,900 tons of concrete and 1,500 tons of municipal waste. • The disposal areas consisted mostly of unprocessed construction debris consisting primarily of large pieces of concrete. The northern disposal area consisted of municipal waste including: cardboard, plastic, paper, landscaping debris, rubber, carpet, electrical and auto parts. • No evidence of PFAS materials disposed at Site 3. • A ROD in 2015 designated “No Further Action” or NFA for site soil and “No Action” or NA for sediment, surface water, and groundwater.	No further action
Site 4 OU-1 (Area 4A)	Pushout Area and Closed ER site	• Part of former Hermanville Disposal Area which operated between 1943 and 1960 (pre-dates AFFF use at the Base). • NTCRA between 2011-2013 removed approximately 16,000 tons of waste, debris, and soil contaminated with asbestos. Waste removed from the area consisted of construction debris, sludge, petroleum oil, paints, thinners, and lesser amounts of pesticides and photographic lab waste. • No evidence of PFAS material disposed at Area 4A. • A ROD in 2015 designated NFA for soil and NA for sediment and surface water.	No further action
Site 4 OU-2 (Area 4B)	Former Fire Training Area and Closed ER site	• Identified as a probable fire training area in EPA’s EPIC study and part of former Hermanville Disposal Area which operated between 1943 and 1960 (pre-dates AFFF use at the Base) • Fire training ended prior to 1964 and pre-dates use of AFFF at the base • Current and former fire department personnel were not aware of fire training at this site • A ROD in 2009 designated NFA for soil and NA for sediment and surface water	No further action

TABLE 1
PFAS Site Summaries, Rationale, and Prioritization
NAS Patuxent River, Maryland

Site Name/Location	Description	Rationale	Recommendation
Site 4 OU-3 (Area 4C)	Former Trench Disposal Area and Closed ER site	• Part of former Hermanville Disposal Area which operated between 1943 and 1960 (pre-dates AFFF use at the Base) • NTCRA between 2003-2004 removed approximately 80,000 tons of soil and waste. Waste included municipal waste, construction debris, and 5.6 tons of MEC scrap. • No evidence of PFAS materials disposed at Area 4C. • A ROD in 2009 designated NFA for soil and NA for sediment and surface water	No further action
Site 4 OU-4 (Area 4D)	Surface Disposal Area and Closed ER site	• Part of former Hermanville Disposal Area which operated between 1943 and 1960 (pre-dates AFFF use at the Base). • NTCRA between 2003-2004 removed a 55-gallon drum and approximately 25 tons of associated soil. The drum and soil contained petroleum constituents. • No evidence of PFAS materials disposed at Area 4D. • A ROD in 2009 designated NFA for soil and NA for sediment and surface water	No further action
Site 5	Disposal Site near Pine Hill Run and Closed ER site	• Used as disposal area between 1957 and 1965 (pre-dates AFFF use at the Base). • Disposed items included rusty vehicle parts, coil, springs, scrap metals • NTCRA between 2003-2004 removed approximately 4,500 tons of surface debris and disposed as non-hazardous • NTCRA between 2011- 2012 removed approximately 9,500 tons of soil, debris, and waste material; disposed as non-hazardous • No evidence of PFAS materials disposed at Site 5 • A ROD designated NFA for soil and NA for sediment and surface water	No further action
Site 21	Wastewater Treatment Plant and Active ER site	• Operated between 1942 and 1977 and supported only sanitary waste, not industrial waste or stormwater runoff • Any discharges of AFFF or PFAS between 1970 and 1977 from surface sources or conveyances would not discharge to this wastewater treatment plant • AFFF systems in hangers were installed after closure of this treatment plant. The first hangar with AFFF was not built until 1980 (H1669) • A NTCRA for waste debris in soil and the RI are currently underway	No further action
Site 24	Dry Well Building 114, Former Plating Shop, Closed ER site, Currently RDT&E Storage Lab	• Rinse waters from the plating shop in Building 114 were discharged to the dry well located southwest of the shop from 1943 to 1970 • Activities at Building 114 pre-dates the use PFAS for mist suppressant prior to shop closure in 1970 • NTCRA between 1996 and 2000 removed the dry well, piping, and 101 tons of impacted soil • A ROD in 2007 designated NFA for soil, sediment, surface water, and groundwater	No further action

TABLE 1
PFAS Site Summaries, Rationale, and Prioritization
NAS Patuxent River, Maryland

Site Name/Location	Description	Rationale	Recommendation
Site 25	Solvent Spills Building 114 and Closed ER site	• The Initial Assessment Study identified the site as a disposal area for solvents and cleaning area for paint brushes used in the metal plating shop between 1943 and 1975; however, sampling and a desktop evaluation indicate no evidence of disposal activities at this site. • No evidence of PFAS materials disposed at Site 25 • A Desktop evaluation in 2006 designated NA for soil, sediment, surface water, and groundwater	No further action
Site 27	Construction Debris Disposal Area and Closed ER site	• The Initial Assessment Study identified the site as a disposal area of construction debris and rubble in the 1940s • RI activities in 1996-1997 and in 2001-2002 found no evidence of waste debris at the site • No evidence of PFAS materials disposed at Site 27. • A ROD in 2003 designated NA for soil, sediment, surface water, and groundwater	No further action
Site 29	Carbon Tetrachloride Disposal Are and Closed ER site	• Although historical disposal of waste oils and solvents from Hangars 305 and 306 reportedly occurred at Site 29 during the later 1940s, no documentation of such releases has been identified. • No evidence of PFAS materials disposed at Site 29. • A ROD in 2007 designated NA for soil, sediment, surface water, and groundwater	No further action
Site 43	Solid and Probable Liquid Waste Disposal Area and Closed ER site	• Review of 1938 to 2002 aerial photographs identified features that could potentially be associated with historic dredge disposal that reportedly occurred at Site 43 as a result of dredging the West Patuxent Basin. • No evidence of PFAS material disposed at Site 43. • A SI in 2008 designated NA for soil, sediment, surface water, and groundwater	No further action
Site 45	Disposal Area and Closed ER site	• Area used for asphalt and concrete production prior to construction of the current engine test facility. • No evidence of PFAS materials disposed at Site 45. • A Desktop evaluation in 2003 designated no action for soil, sediment, surface water, and groundwater	No further action
Site 46	Liquid Spill/ Disposal Area, Closed ER site	• May have been used for liquid and /or solids disposal from 1957 until 1965 (pre-dates the use of AFFF at the Base). • No evidence of PFAS materials disposed at Site 46. • A ROD in 2004 designated “No Action” for soil, sediment, surface water, and groundwater	No further action
Site 55	Former Hazardous Waste Storage Hut (demolished), Active ER site	• Former storage hut was present from 1964-2002 • PCBs were associated with past activities at the hut and at a former building located upgradient from the site • No reported AFFF storage, PFAS use, or release at this site • A NTCRA for PCBs in soil was recently completed and the RI is currently underway	No further action

TABLE 1
PFAS Site Summaries, Rationale, and Prioritization
NAS Patuxent River, Maryland

Site Name/Location	Description	Rationale	Recommendation
Building 116	Former Hazardous and Flammable Storage, Current RDT&E Storage Lab	• Formerly a paint and oil storage in 1943 then hazardous storage in 1971 • No reported AFFF storage, PFAS use, or release at this site	No further action
Building 216	Former Corrosion Control Shop adjacent to Hangar 201	• Paint and oil storage in 1944; ground support equipment shop in 1970; corrosion control shelter in 1971; spray paint shop in 1993; and corrosion control in 2002 • Held electroplating waste and demolished in 2003 • No reported AFFF storage, PFAS use, or release at this site	No further action
Building 443	Current Fire Station 2	• Base fire station used for structural fires and emergencies • Extra crash truck housed here with AFFF • No daily equipment checks by the crash truck were performed here	No further action
Building 637	Former Farming Barn	• Storage for fire extinguishers that do not contain AFFF • No reported AFFF storage, PFAS use, or release at this site	No further action
Building 2186	Electroplating Shop	• Electroplating shop built in 1995 and currently in use • Various baths of different chemical coatings to apply to parts for mission use; fume hoods are used for overhead ventilation and safety • Does not use PFAS for mist suppressant • Spent chemical are properly disposed of as hazardous waste	No further action
Hangar 101	Aircraft Maintenance Hangar	• Does not have an AFFF system or store AFFF	No further action
Hangar 109	Engineering Support Special Category Hangar	• Does not have an AFFF system or store AFFF	No further action
Hangar 111	Research, Development, Training & Evaluation (RDT&E) Hangar	• Does not have an AFFF system or store AFFF • Potential plans to install an AFFF system in the future	No further action
Hangar/Building 115	RDT&E Hangar, Former A/C Systems Integration Laboratory	• Former Laboratory from 1944-2004 may have stored transformers outside and been associated with electroplating activities • No reported AFFF or PFAS use or release at this site and does not have an AFFF system	No further action
Hangar 144	Interference Test Laboratory	• Does not have an AFFF system or store AFFF	No further action
Hangar 201	RTD&E Hangar (associated with UST 7)	• Does not have an AFFF system or store AFFF	No further action

TABLE 1
PFAS Site Summaries, Rationale, and Prioritization
NAS Patuxent River, Maryland

Site Name/Location	Description	Rationale	Recommendation
Hangar 301	Main Aircraft Intermediate Maintenance Dept (AIMD) Hangar	• Does not have an AFFF system or store AFFF	No further action
Hangar 305	Air Test and Evaluation Squadron (VX-20) Hangar	• Does not have an AFFF system or store AFFF	No further action
Hangar 306	RDT&E Hangar	• Does not have an AFFF system or store AFFF	No further action
Hangar 2816	Triton Hangar	• Hangar with AFFF fire suppression system and a 30,000-gallon recovery UST • No reported release of AFFF	No further action
Hangar 3252	V-22 Ground Equipment Storage Tension Fabric Hangar	• Does not have an AFFF system or store AFFF • Hangar used for storage only	No further action
Hangar 3254	V-22 Tension Fabric Hangar	• Hangar with AFFF fire suppression system • No reported release of AFFF	No further action

SECTION 3

High Priority Sites

All FTAs, daily equipment check areas, and demonstration areas used after 1970 when AFFF begin being used on the Station are all considered high priority sites. Additional high priority sites include sites as having AFFF systems, identified as having larger releases of AFFF foam or AFFF concentrate or known to have impacted environmental media.

3.1 Fire Training Areas

3.1.1 Site 14 - Old Fire Fighting Burn Pad

3.1.1.1 Description and Operational History

Site Topography, Geology, and Hydrogeology

Site 14 is located in the middle of the airfield immediately adjacent to Echo South Taxiway in the east-central portion of the Station (**Figure 2A**). Site 14 sits at approximately 15 feet above mean sea level (amsl), with little topographic relief. The ground surface is largely paved with asphalt, though the pavement is worn and cracked in places. Unpaved portions of the site are covered with coarse sand, gravel, and cobble. There are several mounds of debris and soil, and pits in the ground surface (**Appendix C, SV-1**). Sparse, scrubby vegetation partially covers the ground surface, including the pavement. The subsurface is reportedly characterized by silt, fine to coarse sand, and gravel (CH2M, 2006).

Groundwater in the shallow, unconfined, surficial aquifer beneath Site 14 is encountered at approximately 12 feet below ground surface (bgs). Groundwater elevation contours based on water level measurements from June 2004 indicate that groundwater flows generally to the north-northeast (CH2M, 2006).

Operational and Investigative History

Based on historical aerial photographs, Site 14 was used from the late 1950s to approximately 1981 by the NAS Patuxent River Fire Department to practice extinguishing aircraft fires with crash trucks using AFFF foam after 1970 (Ervin, 2017). Charred material thought to be remnant of fire training area activities is still present at the site, including what appears to be partially-melted asphalt with gravel (**Appendix C, SV-2**). The apparent extent of the impacted area has diminished greatly since the aerial photographic analysis, which showed the northern half of Site 14 to be discolored. The discolored area included ground surface which has since been paved over for construction of the thrust stand taxiway and pad in the 1970s (CH2M, 2006). Typically, fires at this site were started on a concrete pad using gasoline, diesel oil, or waste oil. Free-phase petroleum product was detected at Site 14. The Station has addressed the petroleum contamination at the site and the site was closed under the MDE Oil Pollution Control Program. The site was removed from the ER Program in early 2006 based upon a Site Investigation recommending no further action for the petroleum contamination. PFAS was not part of the investigation nor sampled.

3.1.1.2 Waste Characteristics

At Site 14, various petroleum fuels were lit on fire on the burn pad and extinguished with AFFF foam to practice fire training. Therefore, both petroleum and AFFF are site-related wastes. The relevant waste material to this investigation is AFFF. The AFFF manufacturer is unknown; various types and concentrations were likely used over the decades this site was used as a FTA.

3.1.1.3 Pathway and Environmental Hazard Assessment

Groundwater Pathway and Targets

Site 14 is entirely paved, with minimal natural ground exposure. The soil pathway and pathway to groundwater are exposed through cracks in the pavement and several observed shallow pits, which may or may not have been present during the site's tenure as an FTA. Cracks in the pavement and/or overland flow of AFFF during fire training to nearby unpaved areas may potentially have allowed some migration of AFFF to groundwater.

There are no monitoring wells or production wells in the vicinity of Site 14 (**Figure 3**). The potential does exist for shallow groundwater contamination from PFAS at the site because fire training activities were conducted with AFFF for long periods of time.

Surface Water Pathway and Targets

The basewide and site maps (**Figure 2A** and **Figure 3**) show stormwater conveyances leading east from Site 14 to a small, unnamed water body, and west from Site 14. The stormwater conveyance to the west appears to have connectivity with Harper's Creek, which flows into the Patuxent River (**Figure 2A**). There is a delineated wetland area to the southwest of Site 14, greater than 500 feet from the Site 14 boundary (**Figure 3**).

Soil and Air Exposure Pathways and Targets

Shallow pits and mounds of soil and charred material suggest that AFFF may have come into contact directly with soil when the FTA was in use. The cracked and rough nature of the asphalt surface is enough of a barrier to preclude significant air transport of dust from PFAS soil particles.

Site 14 is a former FTA and is no longer used for fire training activities. There are no onsite workers or residents. The nearest residential area is the military Gold Coast Housing located approximately 4,000 feet east of Site 14 adjacent to the Patuxent River. There are no schools, daycares, or medical facilities within a 500-foot radius of Site 14.

3.1.2 Air Show Fire Fighting Demonstration Area

3.1.2.1 Description and Operational History

Site Topography, Geology, and Hydrogeology

The former Air Show Fire Fighting Demonstration Area is located on the western side of the Airfield, southeast of the intersection of Taxiway Charlie and Runway 2-20 (**Figure 2A**). The site is an approximate location and is based on historical accounts from retired Station personnel as well as a photograph from a 1969 Tester newspaper of the fire-fighting demonstration (**Appendix C, H-1**). The site is largely flat, and at approximately 25 feet amsl elevation. The site has not previously been characterized, therefore the subsurface geology and hydrology of the site are unknown; however, because of its proximity to Site 14, the site is anticipated to be underlain by silt, fine to coarse sand, and gravel in the shallow subsurface like Site 14 (CH2M, 2006). Similarly, groundwater is anticipated to be encountered around 12 feet bgs.

Operational and Investigative History

The former Demonstration Area was used by the Fire Department to demonstrate aviation fire-fighting techniques to the public during air shows starting back in the 1960s and ending in the early 1970s. Although the site was not formally used as a Fire Training Area, the materials and methods employed were similar to those in use at the FTAs, which is why the site is categorized here as an FTA. The air show fire-fighting demonstrations consisted of lighting fuel in a fuselage to simulate an actual aircraft crash scene and extinguishing the fire with crash trucks. These demonstrations were performed on a paved surface where fuel was contained around the fuselage using sand berms. For years prior to 1970 when this demonstration was conducted, the extinguishing agent used was reportedly a protein foam rather than an AFFF foam. It is estimated that only 3 years of demonstrations used AFFF as the fire extinguishing agent likely from 1970 to 1973 (Ervin, 2017 and Waggoner, 2004). The fire-fighting demonstrations at the Air Shows were discontinued in the early 1970s because of concerns regarding smoke generation as well as other environmental concerns. During the recent visit, no visual evidence of past activities was observed at the approximate site location.

3.1.2.2 Waste Characteristics

Petroleum fuels were lit on fire and extinguished with protein foam and then with AFFF foam for a few years; therefore, petroleum, protein foam and AFFF are considered site-related wastes. The relevant waste material to this investigation is AFFF. The AFFF manufacturer is unknown.

3.1.2.3 Pathway and Environmental Hazard Assessment

Groundwater Pathway and Targets

The approximate area of the former Fire Fighting Demonstration Area is partially paved and partially grass area. The type of ground surface at the time of the demonstrations is not fully known but from historical photos looked to be exposed soil or pavement. The migration of AFFF to nearby unpaved areas or grassy areas is a high probability during the demonstrations.

There are no monitoring wells or production wells near the former fire-fighting demonstration area (**Figure 4**); however, the potential does exist for shallow groundwater contamination from PFAS at the site because demonstration activities were conducted with AFFF for at least 3 years.

Surface Water Pathway and Targets

There are no surface water bodies in the vicinity of the fire-fighting demonstration area (**Figure 4**). The basewide and site maps (**Figure 2A** and **Figure 4**) show stormwater conveyances converging near the former Demonstration Area that lead southeast to an unnamed surface water body. This unnamed surface water body is then connected to the Chesapeake Bay via smaller streams and culverts.

Soil and Air Exposure Pathways and Targets

Similar to the rationale for the groundwater discussion, the potential for AFFF impacts to soil are expected. The pavement and grass surfaces of the area are enough of a barrier to preclude significant air transport of dust from PFAS soil particles.

The former Demonstration Area is no longer used by the Station's Fire Department. There are no onsite workers or residents. There are no schools, daycares, medical facilities, or residential areas within a 500-foot radius of the site **(Figure 4**). Carpenter Park Housing is the nearest residential area at approximately 1.2 miles southwest of the former Demonstration Area.

3.1.3 Site 41 - Fire Fighting Burn Pad

3.1.3.1 Description and Operational History

Site Topography, Geology, and Hydrogeology

Site 41 is located in the north-central portion of the facility, directly north of the intersection between Taxiway Bravo and Runway 14-32 (**Figure 2A**). The core of the site is a flat area sitting at approximately 30 feet amsl, surrounded on the north and east sides by a hill encompassing approximately 10 feet of vertical relief.

The site was observed during the March 2017 field visit to be partially paved; the ground surface was mainly characterized by broken pavement, loose pebbles and cobbles, and scrubby vegetation and a grassy area (**Appendix C, SV-3).** Towards the north end of the site, scraps of metal were observed on the ground, but neither the metal nor the surrounding landscape appeared to have been burned. No visible impacts related to past activities were observed at the site, possibly because the location where most the burning probably occurred appears to have since been paved over with asphalt.

The specific geologic and hydrologic discussion that follows is sourced from the Site 41 RI (CH2M, 2005).

The observed subsurface geology of Site 41 is characterized by unconsolidated well-graded and silty sands. The first 5 feet bgs reportedly consist of silty sand, then transition to a medium-grained yellowish-orange sand present between 5 and 25 feet bgs. The observed subsurface geology is consistent with description of the Lowland Deposits outlined in the discussion of regional geology (Section 1.3.1). Drilling at Site 41 has been confined to depths less than 25 feet; therefore, knowledge of the subsurface below 25 feet bgs is limited to the regional geology presented in Section 1.3.1.

Groundwater was observed from 13 to 15 feet bgs at Site 41. The direction of groundwater flow is to the east-northeast, toward Harper's Creek, which is located approximately 2,000 feet from Site 41. The calculated hydraulic gradient at Site 41 is 0.009. Based on an assumed porosity of 25 percent, the estimated average linear velocity of the horizontal component of groundwater flow in the water table aquifer was calculated to be

27.6 feet per year (0.08 foot per day). No laterally-continuous low-permeability units were observed in the subsurface beneath Site 41; therefore, the water table aquifer is unconfined, and recharge occurs via direct infiltration of precipitation.

Baker Environmental, Inc. (Baker) conducted aquifer testing in 1993 at two of the Site 41 monitoring wells, MW-3 and MW-4, which have since been abandoned. These wells intercepted the surficial aquifer present in the Lowland Deposits. Rising-head slug tests were conducted in both wells, and step-drawdown and constant-rate pumping tests were performed at MW-4. Based on data collected during these tests, the average hydraulic conductivity is 2.1 feet per day (7.5×10^{-4} centimeters per second). This range is consistent with the expected conductivity range for sand and silty sand. The data indicate an aquifer transmissivity of 210 square feet per day (1,574 gallons per day per foot) (CH2M, 2005).

Operational and Investigative History

Site 41 is a former fire training area and burn pad. Based on aerial photographs provided as appendices to the 2005 RI (CH2M, 2005), fire-training was conducted on the now-paved egg-shaped area in the middle of the site, at the end of the north-northwest-trending road leading off Runway 14-32. The RI described this FTA as a 10-foot-diameter round-pit enclosed by a concrete berm, which also was enclosed by earthen berms on the west and east flanks of the site. During interviews conducted in September 2016, site personnel indicated that a mock fuselage was sometimes used at the site to practice extinguishing aircraft fires.

Historical accounts indicate fire-fighting training being conducted at Site 41 frequently, potentially on a weekly basis. Pipes carried contaminated or expired jet propulsion (JP) fuel and waste oil from two nearby underground storage tanks (USTs) to the burn area, where it would be discharged from a pipe and ignited. Then, trainees would extinguish it using AFFF foam from hand-lines off truck-mounted tanks or from turrets on crash trucks. A third UST onsite contained an oil-water separator, and a drain in the burning pit or pad conveyed the residual liquid from fire-training activities to this UST.

As documented in the RI, Station personnel have indicated that burning activities were not confined to the burn pad. Equipment was reportedly staged and burned within an area confined by the two large earthen berms bracketing the eastern and western sides of the site. The use of firefighting liquids, including protein-based foam, saturated the ground around the equipment. Without a vegetation cover and an effective drainage system, the area became muddy and impeded the movement of equipment. A steel platform, removed in the late 1990s, was placed onsite to prevent equipment from becoming mired.

The Site 41 FTA was reportedly used weekly from the 1970s through the 1980s and potentially into the 1990s. An A-6 aircraft crash, on which protein fire-fighting foam was used, was reported to have occurred here around 1968. No visual evidence of past firefighting activities was observed during site visits.

Site 41 was closed under MDE's Oil Control Program in 2005 (CH2M, 2005). Under the ER Program, the 2005 RI concluded that no further action was necessary at the site, due to no unacceptable human health risk or risk to the environment (CH2M, 2005). The site was removed from the ER Program in September 2005 with the signature of a Record of Decision (ROD) for no further action. PFAS were not part of the RI and were not analyzed for.

3.1.3.2 Waste Characteristics

At Site 41, JP fuel and oil were lighted on fire and extinguished with AFFF foam to practice fire training. Per interviews conducted in 2016, various other types of fuels were likely used besides JP fuel; therefore, petroleum and AFFF are considered site-related wastes. Petroleum and other contaminants were investigated as part of the 2005 RI and a no further action determination was made. The relevant waste material to this investigation is AFFF. The AFFF manufacturer is unknown; various types and concentrations were likely used over the time this site was used as a FTA.

3.1.3.3 Pathway and Environmental Hazard Assessment

Groundwater Pathway and Targets

Although the burn pit area was reportedly paved and bermed at the time of burning activities in the 1970s and 1980s. Currently and at the time of the RI, the majority of the site was grass (CH2M, 2005). Fire training exercises were not always confined to the burn pit area. Therefore, it is expected that AFFF came into contact with the ground surface over the course of the many years it was used as a FTA.

Given the unconfined nature and relatively shallow depth (less than 15 feet bgs) of the surficial aquifer, it is anticipated that AFFF infiltrated into the soil and potentially contaminated groundwater.

Monitoring wells used for the RI no longer exist and have since been abandoned at Site 41 (**Figure 5**). There are no production wells near Site 41 (**Figure 5**). The nearest cross-gradient production well is Well 5B approximately 2,400 feet southwest. Well 5B was not tested as part of the USEPA UCMR3 study (Section 1.4; **Appendix A**) (USEPA, 2016b). According to Station personnel, Well 5B does not meet the UCMR3 criteria as PWS well. The potential does exist for shallow groundwater contamination from PFAS at the site because FTA activities were conducted with AFFF for many years.

Surface Water Pathway and Targets

There are no surface water bodies or wetlands within a 500-foot radius of Site 41. The nearest surface water body is a wetland area (greater than 500 feet away) that is connected to Harpers Creek (approximately 1,300 feet away) (**Figure 5**). One stormwater conveyance appears to originate at Site 41 (**Figure 5**) and leads from Site 41 east under Runway 2-20-1 to ultimately discharge into Harper's Creek (**Figure 2A**). This stormwater conveyance was observed to be collapsed and partially filled with soil (**Appendix C, SV-4**). No other inlets or storm drains were observed.

Soil and Air Exposure Pathways and Targets

Similar to the groundwater pathway, AFFF is likely to have impacted the soil at Site 41. It is possible that dust from PFAS on soil particles become airborne; however, since the area is well vegetated with grass, significant dust particle emissions would not be anticipated.

The former FTA at Site 41 is no longer used for fire training by the Station's Fire Department. There are no onsite workers or residents. There are no schools, daycares, medical facilities, or residential areas within a 500-foot radius of Site 14. The nearest residential area is the military Gold Coast Housing located over 1.5 miles southeast of Site 41.

3.2 Non-Fire Training Areas

3.2.1 Crash Trucks Daily Equipment Functioning and Inspection Area

3.2.1.1 Description and Operational History

Site Topography, Geology, and Hydrogeology

The Crash Trucks Daily Equipment Functioning and Inspection Area (Crash Truck Test Area) is located on the south side of the Airfield, between the intersections of Taxiway Alpha with Taxiway Bravo, and Taxiway Alpha with Runway 02-20 (**Figure 2A**). The site consists of a flat area adjacent to the taxiway, which is bordered on the south by a hill. The AFFF foam was reportedly sprayed in the direction of this hill during daily routine equipment checks on the fire and rescue crash trucks. The site previously has not been characterized, but the subsurface geology and hydrology are anticipated to be consistent with the regional geology and hydrology presented in Section 1.3.

Operational and Investigative History

The Crash Truck Test Area is where aviation crash response trucks were taken to test the operational readiness of their onboard AFFF system. AFFF foam was sprayed from the trucks, facing south-southwest toward a field (**Figure 6**). This was done in to observe the spray pattern from the truck and ensure that the AFFF foam mixture was correctly proportioned with water. Typically, the amount of AFFF foam generated during each crash truck test

is 500 to 900 gallons depending on the flow rate of the AFFF system on the truck (NFESC, 2000). At NAS Patuxent River, the crash trucks were tested daily. The period over which equipment functioning testing with AFFF was conducted is unknown, but guidance for using NoFoam Kits in-lieu of the AFFF checks has been around since the mid-2000s. The trucks are currently tested with water only.

3.2.1.2 Waste Characteristics

The waste generated at the Crash Truck Test Area is AFFF. The manufacturer and concentration used are unknown; various types were likely used over the years.

3.2.1.3 Pathway and Environmental Hazard Assessment

Groundwater Pathway and Targets

The Crash Truck Test Area is paved on the northern side adjacent to the taxiway; the south side is an unpaved grassy hill. Based on verbal descriptions of how the crash trucks were tested at this site, most of the AFFF foam was likely discharged into the grassy area. Given that these high-volume releases occurred at least partly on an unpaved surface, it is likely the AFFF percolated into the shallow groundwater over the years.

There is one production well near the Crash Truck Test Area (**Figure 6**), Well 6B, approximately 900 feet northwest of the site. Well 6B is a community supply well contributing an average of around 18,000 gallons per day (gpd) to the PWS network at the Station. This well is approximately 553 feet deep, and is screened in the Aquia aquifer with two confining units separating it from the surficial aquifer. For these reasons, it is unlikely that AFFF discharged at the Crash Truck Test Area has impacted Well 6B. This well was tested as part of the USEPA UCMR3 study (Section 1.4; **Appendix A**) and none of the six PFAS compounds sampled were detected (USEPA, 2016b). However, the potential does exist for the shallow surficial aquifer to have PFAS contamination because of the many years of daily checks using AFFF.

Surface Water Pathway and Targets

The Crash Truck Test Area is not located near any surface water bodies or wetlands **(Figure 6**). It does appear that the few stormwater features present at the site have connectivity with other stormwater conveyances to the north and west that eventually discharge to the Patuxent River (**Figure 2A**).

Soil and Air Exposure Pathways and Targets

Similar to the rationale for the groundwater discussion, the potential for AFFF impacts to soil are expected. The pavement and grass surfaces of the area are enough of a barrier to preclude significant air transport of dust from PFAS soil particles.

The Crash Truck Test Area is no longer used for daily checks by the Air Operations Fire Department (Building 103). There are no onsite workers or residents. There are no schools, daycares, medical facilities, or residential areas within a 500-foot radius of the Crash Truck Test Area. Carpenter Park Housing is the nearest residential area to the site at approximately 1.2 miles southeast of the site.

3.2.2 Building 103 – Air Operations Fire Station (Aviation Crash Response)

3.2.2.1 Description and Operational History

Site Topography, Geology, and Hydrogeology

Building 103, the Air Operations and Aviation Crash Response Fire Department, also known as Fire Station 1 or Air Ops Fire Station, is located on the west side of the Airfield, adjacent to Taxiway Bravo (**Figure 2A** and **Figure 7**). The site is flat, and sits at approximately 35 feet amsl. The site has not previously been characterized, but the subsurface geology and hydrology are anticipated to be consistent with the regional geology and hydrology presented in Section 1.3.

Operational and Investigative History

The Air Ops Fire Station has been in operation since the early 1940s for responses to any incidents involving air operations. It reportedly stores approximately 1,700 gallons of 3M's 3 percent AFFF concentrate in tanks or crash trucks. There have not been any documented AFFF releases from this building; however, this building is recommended for further inspection because of the potential for releases from incidental or inadvertent spills or daily equipment checks over the building's long-term tenure as the Air Ops Fire Station.

3.2.2.2 Waste Characteristics

The only known waste at Building 103 is AFFF. Currently, 1,700 gallons of 3M 3 percent AFFF concentrate are stored at the building in storage containers or the crash trucks. Different types and manufacturers of AFFF are expected to have been stored and used over the building's history.

3.2.2.3 Pathway and Environmental Hazard Assessment

Groundwater Pathway and Targets

Because of the paved nature of the ground surface outside of the fire station, contact of AFFF is expected to have occurred through cracks in the pavement or runoff from the paved areas. Any potential daily equipment checks would have been performed on adjacent grassy areas. The garage in the building where the crash trucks are housed is sloped toward floor grates that would capture AFFF should it be spilled (**Appendix C, SV-5**). These drains go to the sanitary sewer, after first passing the water through an oil-water separator. However, it is possible that incidental releases of AFFF may have occurred during refilling and proportioning of foam in crash trucks, flushing out the lines in crash trucks, and potentially, occasional testing of crash trucks' spray patterns. If these activities occurred in front of Building 103 on the apron adjacent to Taxiway Bravo, some AFFF potentially may have come into contact with the grassy areas east and south of the building. Therefore, AFFF potentially may have percolated into the ground and come into contact with groundwater over many years of operation. However, there are no documented AFFF releases at the site and equipment checks or testing of foam spray patterns were likely done at the crash truck test area.

There are no monitoring wells adjacent to Building 103. There is one production well near Building 103 at Hangar 110 (**Figure 7**), Well 5B, approximately 1,300 feet downgradient and west. Well 5B is a community supply well contributing an average of around 27,000 gpd to the Station public water system. This well is approximately 539 feet deep, and is screened in the Aquia aquifer. Due to the depth of this well, and the presence of two confining units above it in the hydrogeologic sequence, it is unlikely that the groundwater at this well is impacted by AFFF at the Air Ops Fire Station. Well 5B was not tested as part of the USEPA UCMR3 study (Section 1.4; **Appendix A**) (USEPA, 2016b); however, the potential does exist for the shallow surficial aquifer to have PFAS contamination because of the potential releases of AFFF.

Surface Water Pathway and Targets

There are no surface water bodies or wetlands near Building 103. There are stormwater conveyances in the vicinity of Building 103 and they do appear to lead to the Patuxent River (**Figure 2A and Figure 7).**

Soil and Air Exposure Pathways and Targets

It is anticipated that some contact of AFFF with soil may potentially have occurred at the edges of the paved areas or adjacent grass areas. If AFFF did come into contact with soil, the pavement and grass surfaces are enough of a barrier to preclude significant air transport of dust from PFAS soil particles.

The Air Ops Fire Station is still in use by the Fire Department. There are onsite workers but no residents. There are no schools, daycares, medical facilities, or residential areas within a 500-foot radius of Building 103. Lovell Cove Housing is the nearest residential area to the site at approximately 1.6 miles southwest of Building 103.

3.2.3 Building 2385 – Hazardous Materials Storage Facility (HAZMART)

3.2.3.1 Description and Operational History

Site Topography, Geology, and Hydrogeology

Building 2385, HAZMART, is located in the northwest portion of the Station, near the West Patuxent Basin **(Figure 2A**). The building is situated on a flat site at around 40 feet amsl, and is bordered on the south by a steep slope leading to the surface water body known as Supply Pond and Supply Stream at ER Site 9 (**Figure 8**). Since Building 2385 borders Site 9, the subsurface geology and hydrology are anticipated to be consistent with the geology and hydrology of Site 9. There are multiple monitoring wells downgradient from Building 2385 associated with Site 9. These wells have never been sampled for PFAS. Based on the potentiometric surface map generated for the Site 9 RI (CH2M, 2013), groundwater is encountered at approximately 21 feet amsl (approximately 20 feet bgs) in the vicinity of Building 2385. The direction of groundwater flow is south-southeast towards Supply Pond.

Operational and Investigative History

Building 2385, HAZMART, is a building where hazardous materials, including AFFF concentrate, are received and stored. It is equipped with a 600-gallon-capacity AFFF fire suppression system because flammable materials may be stored in the building. The system is charged with 3M 3 percent AFFF concentrate, and was installed in 1996. Floor grates within the building and the AFFF system room lead to an open-topped, concrete holding structure in the northeast corner of the building to capture any spills.

Several known releases have occurred at this building. A release of approximately 50 gallons of concentrate occurred in May 2013 near the test connection valves (on the exterior of the building – **Appendix C, SV-6**). This release occurred in the front of the building, and travelled through the parking lot and infiltrated into the ground through surrounding stormwater ditches and drains heading downhill toward Site 9. In March 2016, an inadvertent release of approximately 10 gallons occurred because of mechanical failure. This release occurred within the AFFF system storage room itself, and all the AFFF concentrate drained into the floor drain and conveyed to the concrete holding structure. Occasional releases during routine system testing and maintenance also have occurred, although the number of incidents are unknown, the volumes released are estimated to be minimal. These releases reportedly were confined to the area of cobbles beneath the test connection valves (**Appendix C, SV-6**). The total amount of AFFF concentrate released during these incidents is estimated to be under 80 gallons.

3.2.3.2 Waste Characteristics

While Building 2385 stores many different types of materials, the pertinent material to this investigation is AFFF. The building is known to store approximately 4,100 gallons of Ansulite 3 percent AFFF concentrate, 1,800 gallons of 3M 3 percent AFFF concentrate, and 10 gallons of 3M 6 percent AFFF concentrate. The building has a 600-gallon-capacity AFFF fire suppression system that is reported to be charged with 3M 3 percent AFFF concentrate from 1996, as the system's foam has reportedly not been changed out since installation.

3.2.3.3 Pathway and Environmental Hazard Assessment

Groundwater Pathway and Targets

While the releases at Building 2385 mostly have been confined to paved surfaces and/or the concrete holding structure, two of the known releases of AFFF at Building 2385 have come into contact with unpaved ground surface. The May 2013 release traveled toward Site 9 to the south and came into contact with small areas of grass and soil near monitoring well PX-S09-MW-05 (**Figure 8**). The incidental releases during routine testing of the system resulted in AFFF contact with the cobble area under the test connection valves. None of these incidents were notable but AFFF concentrate may potentially have percolated into the ground and come into contact with groundwater.

There are 10 monitoring wells within a 500-foot radius of Building 2385 (**Figure 8**); however, these wells are not for potable use and are associated with Site 9. These monitoring wells are all in proximity of Building 2385 and may be used for future assessment of the surficial aquifer. Two production wells near Building 2385, Wells 1P and

3B, are located approximately 1,100 feet and 1,200 feet west and east, respectively. Wells 1P and 3B are community supply wells contributing an average of around 31,400 gpd and 8,100 gpd, respectively, to the Station public water system. These wells are approximately 910 feet and 534 feet deep, respectively. Well 1P is screened in the deeper Patapsco aquifer and 3B is screened in the Aquia aquifer. Because of the depth of these wells, and the presence of multiple confining units above them, it is unlikely that the groundwater in these aquifers is impacted by AFFF release at Building 2385. Both wells were tested as part of the USEPA UCMR3 study (Section 1.4; **Appendix A**) and none of the six PFAS compounds sampled were detected (USEPA, 2016b); however, the potential does exist for the shallow surficial aquifer to have PFAS contamination because of the releases of AFFF concentrate.

Surface Water Pathway and Targets

Supply Pond is located south of Building 2385 and based on the path of travel of releases that have occurred at the site, AFFF may have potentially migrated into Supply Pond. The basewide and site maps (**Figure 2A** and **Figure 8**) shows a stormwater conveyance originating east of the site that leads to Supply Pond. A culvert was observed in a rip-rapped swale on the corner of the grassy area southwest of PX-S09-MW-05; this culvert leads under the road and south toward Supply Pond.

Soil and Air Exposure Pathways and Targets

It is anticipated that some contact of AFFF with soil did occur in the surrounding stormwater ditches and drains and along edges of the paved areas or adjacent grass areas. If AFFF did come into contact with soil, the pavement and vegetated surfaces are enough of a barrier to preclude significant air transport of dust from PFAS soil particles.

Building 2385 is remains in use as the HAZMART. There are onsite workers but no residents. There are no schools, daycares, medical facilities, or residential areas within a 500-foot radius of Building 2385. Lovell Cove Housing is the nearest residential area at 2,832 feet southwest of Building 2385.

3.2.4 Hangar 110 – Test Pilot School Aircraft Hangar

3.2.4.1 Description and Operational History

Site Topography, Geology, and Hydrogeology

Hangar 110, the Test Pilot School (TPS) Aircraft Hangar, is located in the north-central portion of the Station, adjacent to the East Patuxent Basin (**Figure 2A**). The site is flat, and is situated at an elevation of approximately 10 feet amsl. The site has not been characterized previously, but the subsurface geology and hydrology are anticipated to be consistent with the regional geology and hydrology presented in Section 1.3. The direction of groundwater flow is estimated to be north toward the East Patuxent Basin, where groundwater is anticipated to interface with the Patuxent River.

Operational and Investigative History

Hangar 110, the TPS Aircraft Hangar, was built in 1944. The hangar contains one 2,200-gallon-capacity AFFF concentrate tank. This tank, which is charged with 3 percent AFFF concentrate (manufacturer unknown), supplies the hangar's Viking trench-mounted AFFF system (**Appendix C, SV-7**).

In April 2015, the 2,200-gallon concentrate tank was discovered to have entirely drained because of a mechanical or electrical failure. The full contents of the tank were released. There was no indication of the AFFF release or transport pathway, other than AFFF concentrate was visibly seeping through the concrete and ponding in the adjacent stairwell/walkway area in between hangar bays. A 5-gallon spill reported in December 2014 was reportedly remediated by a contractor. However, no samples have been collected and analyzed for PFAS. The AFFF system is currently non-operational.

3.2.4.2 Waste Characteristics

The waste generated at Hangar 110 is AFFF concentrate. The type of AFFF is unknown but anticipated to be manufactured by either Chemguard or National Foam due to compatibility with the Viking trench-mounted system.

3.2.4.3 Pathway and Environmental Hazard Assessment

Groundwater Pathway and Targets

The area around Hangar 110 is entirely paved or concrete, so the groundwater pathway would unlikely be a complete pathway. However, when the April 2015 release occurred, no trace of the AFFF concentrate was observed. The minimal observation of AFFF on the concrete in the mechanical room and ponding in the adjacent stairwell/walkway area suggests that AFFF may have seeped into the ground through cracks or expansion joints in the concrete. If this is the case, 2,200 gallons of AFFF concentrate potentially may have percolated to groundwater to the unconfined surficial aquifer.

There are no monitoring wells in the vicinity of Hangar 110. One production well, Well 5B, is in proximity to Hangar 110 (**Figure 9**). Well 5B is only approximately 60 feet upgradient and south of the hangar in Building 590. Well 5B is a community supply well contributing an average of around 27,000 gpd to the Station public water system. This well is approximately 539 feet deep, and is screened in the Aquia aquifer. Due to the depth of this well, and the presence of two confining units above the screened interval in the hydrogeologic sequence, it is unlikely that the groundwater at this well is impacted by the AFFF releases. Well 5B was not tested as part of the USEPA UCMR3 study (Section 1.4; **Appendix A**) (USEPA, 2016b); however, the potential does exist for the shallow surficial aquifer to have PFAS contamination because of the large release of AFFF concentrate.

Surface Water Pathway and Targets

Hangar 110 is situated adjacent to the East Patuxent Basin. A delineated wetland is near the south side of the hangar. Stormwater conveyances originate at the hangar and lead to the wetland and East Patuxent Basin (**Figure 9).** Due to the uncertainty regarding the travel path of the AFFF concentrate that leaked, it is unknown whether any AFFF may have migrated to the nearby surface water bodies. Another potential pathway, if AFFF percolated into groundwater, is the groundwater-to-surface water interface pathway.

Soil and Air Exposure Pathways and Targets

It is anticipated that some contact of AFFF with soil potentially may have occurred at the cracks in asphalt or expansion joints in the concrete. If AFFF did come into contact with soil, the pavement and concrete surfaces are enough of a barrier to preclude significant air transport of dust from PFAS soil particles.

Hangar 110 remains active as the TPS Aircraft Hangar. There are onsite workers but no residents. There are no schools, daycares, medical facilities, or residential areas within a 500-foot radius of Hangar 110. Lovell Cove Housing is the nearest residential area at approximately 1.3 miles southwest of Hangar 110.

3.2.5 Hangar 2133 – Joint Strike Fighter Aircraft Hangar

3.2.5.1 Description and Operational History

Site Topography, Geology, and Hydrogeology

Hangar 2133, Joint Strike Fighter Aircraft Hangar, is located in the south-central portion of the Station, adjacent to Taxiway Echo (**Figure 2A** and **Figure 10**). The hangar is situated in a flat area at an elevation of approximately 15 feet amsl. The site has not been characterized previously, but the subsurface geology and hydrology are anticipated to be consistent with the nearby Site 24, because of proximity and similar elevation. Observations during drilling of the Site 24 monitoring wells (**Figure 10**) indicated the subsurface is comprised of sand, with localized silty or gravelly zones, to a depth of at least 22 feet. Sediments were noted to be relatively uniform at the site and represent the upper portion of the Lowland Deposits, which are typically expressed as a stratified clay, silt and medium to coarse sand and gravel (CH2M, 2007a).

Operational and Investigative History

Hangar 2133 was built in 1933. The hangar is equipped with both overhead (water-only) and cannon (AFFF) fire suppression systems. Four 1,000-gallon tanks of Ansulite 3 percent AFFF concentrate supply the AFFF fire suppression system. The system was previously charged with 6 percent concentrate, but was switched to 3 percent in approximately 2010.

Multiple inadvertent releases have occurred in the hangar. These releases occurred in November 2002, June 2005, and April 2010. During one of these incidents (date unknown), the cannon system for the entire hangar was activated inadvertently. The quantities of AFFF concentrate or foam for these releases are unknown. The 2010 release resulted in a notable quantity of foam to be sent to the sanitary sewer via the bypass valve of the oil/water separator, effectively "foaming" the METCOM wastewater treatment plant (WWTP). METCOM had to shut off sewage flow and manage the reactivated AFFF in all the aeration basins. An AFFF retention tank exists, but diversion to the tank is not automatic; it must be engaged using a T-valve that is located outside of the hangar bay doors. The collection system has never successfully been engaged during a release according to Station personnel. On at least one occasion, the AFFF foam has been intentionally pushed out the hangar bay doors and AFFF has come into contact with the grassy area southeast of the apron. Additionally, on at least two occasions, AFFF was observed down the stormwater culvert leading to the drainage ditch near Hangar 115.

3.2.5.2 Waste Characteristics

The waste generated at Hangar 2133 is AFFF and concentrate. The hangar's fire suppression system is charged with Ansulite 3 percent AFFF concentrate.

3.2.5.3 Pathway and Environmental Hazard Assessment

Groundwater Pathway and Targets

Hangar 2133 and the immediate vicinity are largely covered in a concrete apron. However, there are small grassy areas at the edge of the concrete. One of the releases at the hangar was reportedly cleaned up by pushing the foam out of the hangar bay doors. Some of the foam reportedly came into contact with the grassy areas southeast of the apron (**Figure 10**). Thus, AFFF potentially percolated through the soils into the groundwater. However, due to the small size of the exposed area and the lack of repeated occurrences, it is unlikely that AFFF has significantly impacted groundwater at the site.

Monitoring wells used for the RI at nearby Site 24 no longer exist and have since been abandoned. Farther downgradient from Hangar 2133 are monitoring wells for ER Site 55. These monitoring wells may be used for future assessment of the downgradient surficial aquifer. Three production wells are near Hangar 2133, Wells 1C, 2C, and 3C, approximately 1,500 feet, 1,400 feet, and 1,100 feet west, south, and east, respectively. All three wells are community supply wells contributing an average of around 49,000 gpd, 53,000 gpd, and 71,000 gpd, respectively, to the Station public water system. Wells 1C, 2C, and 3C are approximately 500 feet, 553 feet, and 520 feet deep, respectively. All three wells are screened in the in the Aquia aquifer. Due to the depth of these wells, and the presence of multiple confining units above them, it is unlikely that the groundwater in these aquifers is impacted by AFFF release at Hangar 2133. All three wells were tested as part of the USEPA UCMR3 study (Section 1.4; **Appendix A**) and none of the six PFAS compounds sampled were detected (USEPA, 2016b); however, the potential does exist for the shallow surficial aquifer to have PFAS contamination because of the releases of AFFF.

Surface Water Pathway and Targets

Several delineated wetland areas are north-northeast and southwest of Hangar 2133 (**Figure 10)**. There are no apparent drainage features from Hangar 2133 to any of these wetland areas. The only apparent drainage is stormwater culvert on the southeast side of the hangar leading to the drainage ditch near Hangar 115. Surface water has been impacted by releases of AFFF from Hangar 2133.

Soil and Air Exposure Pathways and Targets

Because of the known release of AFFF to a small grassy area southeast of the concrete apron at Hangar 2133, it is expected that soil in that small area is potentially impacted by PFAS. However, since the area is vegetated, significant dust particle emissions from the soils are not anticipated.

Hangar 2133 is an active complex for the Joint Strike Fighter. There are onsite workers but no residents. There are no schools, daycares, medical facilities, or residential areas within a 500-foot radius of Hangar 2133. Gold Coast Housing is the nearest residential area at approximately 1,000 feet east and northeast of Hangar 2133.

3.2.6 Hangar 2835 – Air Test & Evaluation Squadron 20 (VX-20) Hangar

3.2.6.1 Description and Operational History

Site Topography, Geology, and Hydrogeology

Hangar 2835, VX-20, is located in the west-central portion of the Station, adjacent to Taxiway Alpha (**Figure 2A**). The site is flat, and sits at approximately 45 feet amsl (**Figure 11**). The hangar, built in 2007, occupies the closed ER Site 29, Carbon Tetrafluoride Disposal Area (CH2M, 2007b). Historical disposal of waste oils and solvents from Buildings 305 and 306 reportedly occurred at Site 29 during the late 1940s (CH2M, 2007b).

Because of the vicinity of Hangar 2835 to Site 29, the subsurface geology elucidated by the Site 29 RI is applicable. The observed subsurface of Site 29 is characterized by a 3-to 5-foot layer of unconsolidated sandy silt (topsoil) underlain by a thick layer of unconsolidated sand and gravel, with intermittent layers of unconsolidated silt and clay deposits. The depth to the water table of the surficial aquifer is approximately 11 to 17 feet bgs. The water table aquifer is unconfined, and flows predominantly to the southwest within the unconsolidated sand and gravel deposits. Recharge occurs via direct infiltration of precipitation (CH2M, 2007b).

Operational and Investigative History

Hangar 2835, the Air Test & Evaluation Squadron 20 (VX-20) Hangar, was built in 2007, and is a temporary tension fabric hangar. It is equipped with an AFFF fire suppression system charged by two 800-gallon tanks of 3 percent AFFF concentrate (manufacturer is unknown) (**Appendix C, SV-8**). During system activation, AFFF is discharged via four cannons, one in each corner of the building (**Appendix C, SV-9**). Hangar 2835 does not have floor drains, secondary containment, or a retention tank for AFFF because of the temporary nature of the structure.

Documented releases of AFFF at Hangar 2835 occurred in January 2014 (approximately 40 gallons), February 2015 (approximately 15 gallons), and October 2015 (approximately 80 gallons). The two winter releases of AFFF concentrate were due to hangar doors being left open in cold weather, causing AFFF system components to rupture. The October 2015 release was due to inadvertent system activation. AFFF foam has reportedly spilled onto the apron northeast of the hangar, and onto a small, narrow grassy area northeast of the building.

Under the ER Program, fieldwork to complete the RI was performed in late 2005. The RI for Site 29 concluded that due to a lack of human health or ecological risk, a feasibility study and remedial action were not required (CH2M, 2007b). The site was removed from the ER Program in September 2007 when the 'no action' ROD was signed. PFAS were not part of the RI nor sampled.

3.2.6.2 Waste Characteristics

The waste generated at Hangar 2835 is AFFF foam and concentrate. The hangar's fire suppression system is charged with 3% percent AFFF concentrate (manufacturer is unknown).

3.2.6.3 Pathway and Environmental Hazard Assessment

Groundwater Pathway and Targets

The site of Hangar 2835 and the 100-foot radius around it is largely paved (**Figure 11**); however, there are small grassy areas nearby. During at least one release, AFFF foam reportedly came into contact with the unpaved ground surface northeast of the hangar. It is likely that AFFF potentially has impacted shallow groundwater at the site because of the multiple releases of AFFF and lack of drains and secondary containment.

Monitoring wells used for the RI at nearby Site 24 no longer exist and have since been abandoned. There is one production well approximately 1,000 feet southeast of the Hangar 2835. Well 1B is a community supply well contributing an average of around 111,700 gpd to the Station public water system. This well is approximately 567 feet deep, and is screened in the Aquia aquifer with two confining units separating it from the surficial aquifer. For these reasons, it is unlikely that AFFF discharged at Hangar 2835 impacted the groundwater in supply Well 1B. This well was tested as part of the USEPA UCMR3 study (Section 1.4; **Appendix A**) and none of the six PFAS compounds sampled were detected (USEPA, 2016b); however, the potential does exist for the shallow surficial aquifer to have PFAS contamination because of the releases of AFFF.

Surface Water Pathway and Targets

There are no surface water bodies or delineated wetlands in the vicinity of Hangar 2835. Stormwater conveyances appear to originate on the east side of the hangar and continue west towards a surface water body that eventually feeds into Gardiner Pond (**Figure 2A** and **Figure 11**). It is unknown whether there is complete connectivity between the stormwater conveyances and the surface water features, but such conveyances are presumed to be present. As such, AFFF potentially comes into contact with surface water and ultimately, has been transported to Gardiners Pond. However, given the limited extent of known releases, it is unlikely that a notable quantity of AFFF was transported via surface water.

Soil and Air Exposure Pathways and Targets

Because of the known release of AFFF to a small unpaved area east of the hangar, it is anticipated that soil in that small area may have potentially been impacted by PFAS. However, since the area is grassy, significant dust particle emissions from the soils are not anticipated.

Hangar 2838 is an active facility for VX-20. There are onsite workers but no residents. There are no schools, daycares, medical facilities, or residential areas within a 500-foot radius of Hangar 2835. Carpenter Park Housing is the nearest residential area at approximately 1 mile southwest of Hangar 2835.

SECTION 4

Medium Priority Sites

Sites were distinguished as medium priority if it had an AFFF system with several moderate releases of AFFF concentrate that were either captured by a recovered system or cleaned up but still may have impacted environmental media.

4.1 Building 1669 – "Hush House" (Aircraft Engine Test Cell)

4.1.1 Description and Operational History

4.1.1.1 Site Topography, Geology, and Hydrogeology

Building 1669, the "Hush House" (Aircraft Engine Test Cell) is located in the south-central portion of the Station, south of Taxiway Alpha (**Figure 2A**). The site is flat and at an elevation of approximately 15 feet amsl (**Figure 12**). The site has not previously been characterized, but the subsurface geology and hydrology are anticipated to be consistent with the regional geology and hydrology presented in Section 1.3.

4.1.1.2 Operational and Investigative History

Building 1669 was built in 1980 and used as a testing area for aircraft engines. The facility is protected by an 1,800-gallon-capacity AFFF fire suppression system, charged with 3% AFFF concentration (manufacturer unknown). The system was initially installed in 1979, at which time a 6% formulation was used. The system was reportedly switched to 3 percent concentrate in the mid-2000s.

The following information was provided by Station personnel during the site interviews regarding potential releases at Building 1669 in 1991, mid-2000s, 2007, and 2010:

- A release of an unknown quantity of AFFF concentrate occurred at an unknown date, and spilled onto the ground, including the unpaved cut-out area to the southeast of the building. The impacted soil was excavated and disposed offsite. It is likely that this event occurred prior to 1991.
- A release of up to 500 gallons of AFFF concentrate that occurred in the mid-2000s, prior to the switch to 3 percent foam concentrate. This release reportedly went to a nearby oil-water separator, which leads to METCOM.
- An all-water release (no AFFF concentrate) occurred in 2007. The AFFF part of the system had been shut off for repairs so when the system was activated, only water was released.
- In 2010, a pipe ruptured in the AFFF system; however, because the pipe rupture was located before the AFFF concentrate tank only water was released from the system.

4.1.2 Waste Characteristics

The waste generated at Building 1669 that is relevant to this investigation is AFFF concentrate. The current stock of AFFF in the building is a 3 percent formulation, of an unknown manufacturer. It is estimated that a 6 percent formulation (manufacturer also unknown) was in place at the time of the 1991 and mid-2000 releases.

4.1.3 Pathway and Environmental Hazard Assessment

4.1.3.1 Groundwater Pathway and Targets

There are some unpaved, grassy areas near Building 1669, and at least one account of a release to the ground. Therefore, there is the potential AFFF may have migrated to the shallow groundwater.

There are no monitoring wells in the vicinity of Building 1669 (**Figure 12**). The nearest production well is Well 1C in Building 523. Well 1C is approximately 1,700 feet to the south from Building 1669 and is a community supply well contributing an average of around 49,500 gpd to the Station public water system. This well is approximately 500 feet deep, and is screened in the Aquia aquifer with two confining units separating it from the surficial aquifer. This well was tested as part of the USEPA UCMR3 study (Section 1.4; **Appendix A**) and none of the six PFAS

compounds analyzed were detected (USEPA, 2016b); however, the potential does exist for the shallow surficial aquifer to have PFAS contamination because of the releases of AFFF.

4.1.3.2 Surface Water Pathway and Targets

There is a surface water body and wetlands more than 500 ft north of Building 1669 (**Figure 12**). During a release AFFF would have likely exited the building on the south side where there is a rollup door leading to the concrete apron. There is one stormwater conveyance that goes underneath the apron to carry stormwater just outside the rollup doors to the grassy area south of the apron. It does not appear to convey stormwater to the east or north to the surface water body and wetlands.

4.1.3.3 Soil and Air Exposure Pathways and Targets

Because of the known release of AFFF to possibly the ground southeast of the building, it is expected that soil in that small area may have potentially been impacted by PFAS. However, since the area is grassy, significant dust particle emissions from the soils are not anticipated.

Building 1669 is an active facility for testing of aircraft engines. There are onsite workers but no residents. There are no schools, daycares, medical facilities, or residential areas within a 500-foot radius of Building 1669. Gold Coast Housing is the nearest residential area at approximately 3,200 feet east and northeast of Building 1669.

4.2 Hangar 2805 – Presidential Helicopter Hangar

4.2.1 Description and Operational History

4.2.1.1 Site Topography, Geology, and Hydrogeology

Hangar 2805, the Presidential Helicopter Hangar, is located in the northeast portion of the Station (**Figure 2A**). The site is flat and at an elevation of approximately 15 feet amsl. It is bound on the north and east by Harper's Creek (**Figure 13**). The site has not previously been characterized, but the subsurface geology and hydrology are expected to be consistent with the regional geology and hydrology presented in Section 1.3.

4.2.1.2 Operational and Investigative History

Hangar 2805 was built in 2007 to support the Marine Corps' Marine One Helicopter Squadron Program. The hangar is equipped with a 2,750-gallon capacity AFFF fire suppression system. The system is charged with Aer-o-Water 3% AFFF concentrate, manufactured by National Foam. The hangar also has a 900-foot long by 4-foot-diameter cylindrical concrete underground tank for recovery of AFFF or other potentially spilled liquids. The valve controlling the pathway from the floor drains to the sanitary sewer system automatically closes in the event of an AFFF system release, but the valve to divert the AFFF to the recovery system must be manually engaged.

Hangar 2805 has had several AFFF releases since construction in 2007. According to the AFFF discharge log, approximately 400 gallons of AFFF concentrate were released in November 2009 due to mechanical failure in the fire suppression system mechanical room. Secondary containment reportedly failed during this incident, and the release had to be recovered and disposed. AFFF was reportedly confined to the building. Secondary containment components were subsequently repaired. In February 2014, a release of approximately 40 gallons of AFFF concentrate occurred when the water-only sprinkler activated in the lobby and personnel were attempting to shut it off. Another release of 15 gallons occurred in November 2015. These hangar-contained releases resulted in AFFF being diverted to the recovery tank, which was reportedly then emptied and disposed of properly.

4.2.2 Waste Characteristics

The waste generated at Hangar 2805 that is relevant to this investigation is AFFF concentrate. The hangar's fire suppression system is charged with Chemguard's Aer-o-Lite 3 percent AFFF concentrate.

4.2.3 Pathway and Environmental Hazard Assessment

4.2.3.1 Groundwater Pathway and Targets

Because of the lack of releases outside the hangar, transport of AFFF to groundwater at Hangar 2805 is unlikely; however, if the recovery system or tank has never been drained, there may potentially be leaks to the soil and groundwater underneath of it.

There are no monitoring wells in the vicinity of Hangar 2805. One production well, Well 253A, located approximately 500 feet from Hangar 2805 (**Figure 13**) is an independent supply well contributing an average of 230 gpd to Building 253. This well is approximately 670 feet deep, and is screened in the Aquia aquifer with two confining units separating it from the surficial aquifer; therefore, not likely to have downward migration of PFAS from the surficial aquifer. Well 253A was not tested as part of the USEPA UCMR3 study (Section 1.4; **Appendix A**) (USEPA, 2016b). The potential does exist for the shallow surficial aquifer to have PFAS contamination if releases were not confined to the mechanical room or the hangar and if the underground recovery tank is found to have possible leaks to the subsurface. The recovery tank should be checked and emptied of any spilled liquids.

4.2.3.2 Surface Water Pathway and Targets

Because of the lack of releases outside the building, transport of AFFF to surface water at Hangar 2805 is highly unlikely. There are stormwater conveyances in the vicinity of the hangar, and the Harper's Creek surface water body is immediately behind Hangar 2805, but is not anticipated to have been impacted by the AFFF releases from the hangar (**Figure 13**).

4.2.3.3 Soil and Air Exposure Pathways and Targets

Transport of AFFF to soil at Hangar 2805 is highly unlikely since releases were reportedly confined to the hangar. Therefore, there is also not likely an air pathway, because AFFF has not come into contact with the soil.

Hangar 2805 is an active facility for the Presidential Helicopter. There are onsite workers but no residents. There are no schools, daycares, medical facilities, or residential areas within a 500-foot radius of Hangar 2805. Gold Coast Housing is the nearest residential area at approximately 1 mile east of Hangar 2805.

4.3 Hangar 2905 – Aircraft Prototype Facility

4.3.1 Description and Operational History

4.3.1.1 Site Topography, Geology, and Hydrogeology

Hangar 2905 is located in the south-central portion of the Station (**Figure 2A**). The site is flat and is at an elevation of approximately 30 feet amsl (**Figure 14).** The subsurface geology and hydrology have not been directly observed, though are expected to be consistent with the regional description presented in Section 1.3.

4.3.1.2 Operational and Investigative History

Hangar 2905, Aircraft Prototype Facility, is an aircraft hangar used for research, test and development purposes. Construction of the facility was completed in 2010 (NAWCAD, 2010). The facility is protected by a 750-gallon capacity trench-mounted AFFF fire suppression system. The system is charged with Chemguard 3 percent AFFF concentrate. The interior of the hangar was not observed during site visits due to access restrictions. The suppression system is equipped with automatic diversion to a 25,000-gallon AFFF retention tank. Reportedly, AFFF has never been released from the system within the hangar.

Two notable releases have occurred within the fire suppression system mechanical room, one in May 2011, and another in November 2015. Both of these releases were 150 gallons of AFFF concentrate. The May 2011 release reportedly flowed into the floor drain, which discharged into the sanitary sewer system, and was then discharged to St. Mary's METCOM wastewater treatment plant. This event reportedly inundated the WWTP plant with foam. The floor drain was thereafter plugged to avoid recurrence. A similar release in 2015 occurred in this mechanical room and reportedly, AFFF concentrate was stopped from going down the drain and never left the mechanical room or possibly flowed onto the ground outside.

4.3.2 Waste Characteristics

The waste generated at Hangar 2905 that is relevant to this investigation is AFFF concentrate. The hangar's fire suppression system is charged with Chemguard 3 percent AFFF concentrate.

4.3.3 Pathway and Environmental Hazard Assessment

4.3.3.1 Groundwater Pathway and Targets

Because of the nature of the releases inside the building's mechanical room, transport of AFFF to groundwater at Hangar 2905 is unlikely. There are no monitoring wells or production wells in the vicinity of Hangar 2905. The nearest production well is Well 4C approximately 2,200 feet to the southeast of Hangar 2905. The potential does exist for the shallow surficial aquifer to have PFAS contamination if releases were not confined to the mechanical room.

4.3.3.2 Surface Water Pathway and Targets

Because of the nature of the releases inside the building, transport of AFFF to adjacent surface water outside Hangar 2905 is unlikely. Also, hangar 2905 does not have any nearby surface water features or stormwater conveyances in the vicinity (**Figure 14**). The hangar is surrounded by grass and woods and minimal low-lying areas that would convey surface water.

4.3.3.3 Soil and Air Exposure Pathways and Targets

Transport of AFFF to soil at Hangar 2905 is unlikely since releases were reportedly confined to the mechanical room. Therefore, there an air transport pathway is unlikely because AFFF has not come into contact with the soil.

Hangar 2905 is an active facility for research, test and development purposes. There are onsite workers but no residents. There are no schools, daycares, medical facilities, or residential areas within a 500-foot radius of Hangar 2905. Gold Coast Housing is the nearest residential area at approximately 1 mile east and northeast of Hangar 2905.

SECTION 5

Low Priority Sites

The following sites are all designated low priority. The results of the research conducted as part of this PA suggest environmental media are possibly impacted by PFAS. These low priority sites have uncertainty due to the timing and quantity of AFFF released. Two of the sites are known to have occurred about the time the Station started using AFFF for emergency response (i.e., 1970) and all of the sites were one-time releases of AFFF foam from crash trucks which were not contained and released unknown quantities of AFFF foam. However, impact to environmental media at these sites are estimated to be minimal for multiple reasons: majority of the releases occurred over 25 years ago, diluted AFFF foam was released instead of AFFF concentrate, crash truck response was to limited spatial areas, and releases were single incidents over short periods of time. These sites were not visited during March 2017 field visits and were evaluated based primarily upon interviews and the desktop document research effort.

5.1 Buildings 215 and 217 – Engine Test Area

Site Topography, Geology, and Hydrogeology

Buildings 215 and 217 are located in the south-east portion of the Station near the Chesapeake Bay Basin (**Figure 2A**). The site is flat and is at an elevation of approximately 15 feet amsl. The subsurface geology and hydrology have not been directly observed, though are expected to be consistent with the regional description presented in Section 1.3.

Operational and Investigative History

This site, an Engine Test Area between Building 215 (storage) and Building 217 (blast wall), is where the first reported use of AFFF foam for a fire occurred at NAS Patuxent River. In December 1970, an F-8 aircraft was being tested. The aircraft was chained to the ground to keep immobile while the jet engine was turned up for testing purposes. During the test, the engine and plane caught on fire. The Fire Department responded using AFFF foam to extinguish the fire. The release was not contained and it was on a concrete apron. No other releases of AFFF have been documented in this area and there is some uncertainty if protein foam or AFFF foam was used since 1970 was the approximate time the Station started using AFFF for emergency response.

Waste Characteristics

AFFF is the waste generated at the Engine Test Area that is relevant to this investigation. The manufacturer of the AFFF sprayed is unknown and the quantity of AFFF foam used is unknown.

5.2 Building 102 – Marine Aviation Detachment (Current)

Site Topography, Geology, and Hydrogeology

Building 102 is located in the central portion of the Station near Taxiway Alpha (**Figure 2A**). The site is flat and is at an elevation of approximately 45 feet amsl. The subsurface geology and hydrology have not been directly observed, though are expected to be consistent with the regional description presented in Section 1.3.

Operational and Investigative History

Building 102, currently the Marine Aviation Detachment (MAD) was formerly one of the Station's Fire Departments for NAS Patuxent River. The fire house was built for WWII around 1945, and was used through the 1970s. Its use changed from a fire station to the Marine Aviation Detachment in the mid-1980s. Fire extinguisher training was reportedly conducted here with protein foam. A historical photograph (circa 1970) shows a wheeled fire extinguisher being used on a shipping container (**Appendix C, H-2**). These older extinguishers were known to carry only protein foam and not AFFF foam. In another historical photograph (circa 1970), AFFF foam looks to have been sprayed onto the grassy area adjacent to the building from a new yellow crash truck as a demonstration of its capabilities (**Appendix C, H-3**). On a personal account by a former fire fighter, he said the

newer yellow crash trucks contained AFFF at the time (early 1970s) while the older red crash trucks contained protein foam (Ervin, 2017). The releases were not contained and allowed to seep into the grassy area.

Waste Characteristics

The waste at the building relevant to this investigation is AFFF. The only record of a release is from the historical photograph that suggests AFFF foam may have been discharged from a new yellow crash trucks near Building 102 (**Appendix C, H-2**) and the quantity of AFFF foam used is unknown.

5.3 Building 840 – Skeet Range – Aircraft Crash Site

Site Topography, Geology, and Hydrogeology

Building 840 is located in the south central portion of the Station near Holton Pond (**Figure 2A**). The site is flat and is at an elevation of approximately 35 feet amsl. The subsurface geology and hydrology have not been directly observed, though are expected to be consistent with the regional description presented in Section 1.3.

Operational and Investigative History

The Skeet Range was the site of a T-38A Talon aircraft crash in July 2000. Firefighters responded to the scene of the crash, using 3 percent AFFF foam from a crash truck. Additionally, an A-37 aircraft crashed on the Skeet Range sometime before 1991 (exact date is unknown), and AFFF foam from a crash truck was used to extinguish the fire. Both releases were not contained and the crash areas consist of grass and vegetation. No other releases of AFFF have been documented in this area.

Waste Characteristics

AFFF is the waste generated at the crash sites that is relevant to this investigation. The manufacturer of the AFFF sprayed is unknown and the quantity of AFFF foam used is unknown.

5.4 Bronson Road – Aircraft Crash Site

Site Topography, Geology, and Hydrogeology

The Bronson Road aircraft crash site is located on the northern side of Runway 14-32 in the north-central portion of the Station and leads to Hangar 2805 (**Figure 2A**). The area is flat and is at an elevation of approximately 20 feet amsl. The subsurface geology and hydrology have not been directly observed, though are expected to be consistent with the regional description presented in Section 1.3.

Operational and Investigative History

Bronson Road was the site of an F/A-18 Hornet crash in 1992. The pilot and copilot ejected from aircraft, which then crashed and slid into a vehicle on the ground, killing the driver. Firefighters responded to crash, using AFFF foam from a crash truck. The release was not contained and the area consisted of asphalt, grass, and vegetation. No other releases of AFFF have been documented in this area.

Waste Characteristics

AFFF is the waste generated at the crash site that is relevant to this investigation. The manufacturer of the AFFF sprayed is unknown and the quantity of AFFF foam used is unknown.

SECTION 6

No Action Sites

There are 32 sites designated as No Action Sites. These sites, which include former ER sites and disposal areas, were designated as No Action Sites because the information gathered during interviews and follow-on document research showed no AFFF storage or system, no reported use of PFAS material or mist suppressant, and no release of PFAS to the environment. Environmental media at these sites are not expected to be impacted by PFAS. Site visits were not conducted at these sites and transport and exposure pathways were not evaluated. A site description and the detailed rationale for the No Action designation for each site is also presented in **Table 1** and the locations of the No Action sites are presented on **Figure 2B**.

SECTION 7

Conclusions and Recommendations

7.1 High and Medium Priority Sites

Based on the known history of releases and other information gathered, nine high priority and three medium priority were identified. These sites are likely impacted by PFAS from the use of AFFF. The sources of the PFAS were either through fire training, demonstrations, repeated equipment checks, intentional releases from AFFF fire suppression systems, or unintentional releases associated with AFFF systems. Sampling of environmental media as part of SIs is recommended at all high and medium priority sites (**Table 1**). SIs should be tailored to each site based upon the approximate location of reported releases, quantity, and nature of the release.

The potential impact of the PFAS releases on the surface water is likely low after extended periods of time since the releases and impacts to this media would be hard to determine. Soil sampling should be considered if PFAS is found at high concentrations in the shallow groundwater and to help determine if any source areas in the soil are contributing to groundwater concentrations.

7.2 Low Priority Sites

Four sites were identified to have uncertainty due to the timing and quantity of AFFF released (**Table 1**). Two of the sites are known to have occurred about the time the Station started using AFFF for emergency response and all sites were one-time releases of AFFF foam from crash trucks which were not contained and released unknown quantities of AFFF foam. However, impact to environmental media at these sites are estimated to be minimal for multiple reasons: majority of the releases occurred over 25 years ago, diluted AFFF foam was released instead of AFFF concentrate, crash truck response was to limited spatial areas, and releases were single incidents over short periods of time. The impact of the releases to environmental media may be minimal but is still unknown at this time; therefore, sampling is recommended as part of SIs contingent upon funding following the SIs for the high and medium priority sites.

7.3 No Action Sites

A total of 32 sites were designated No Action (**Table 1**). Environmental media at these sites are not expected to be impacted by PFAS.

SECTION 8

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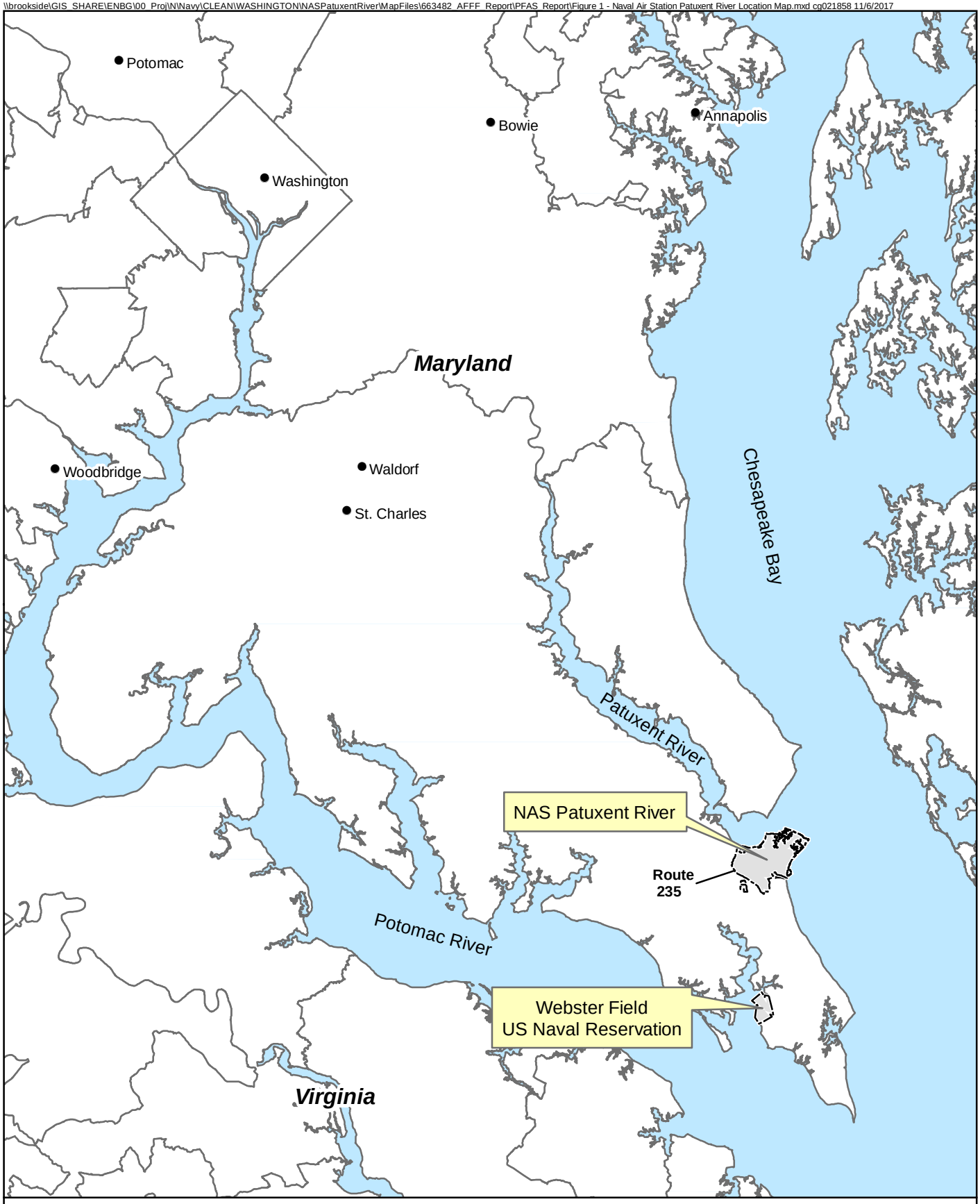
Figures



Legend
- Cities
- Installation Boundary

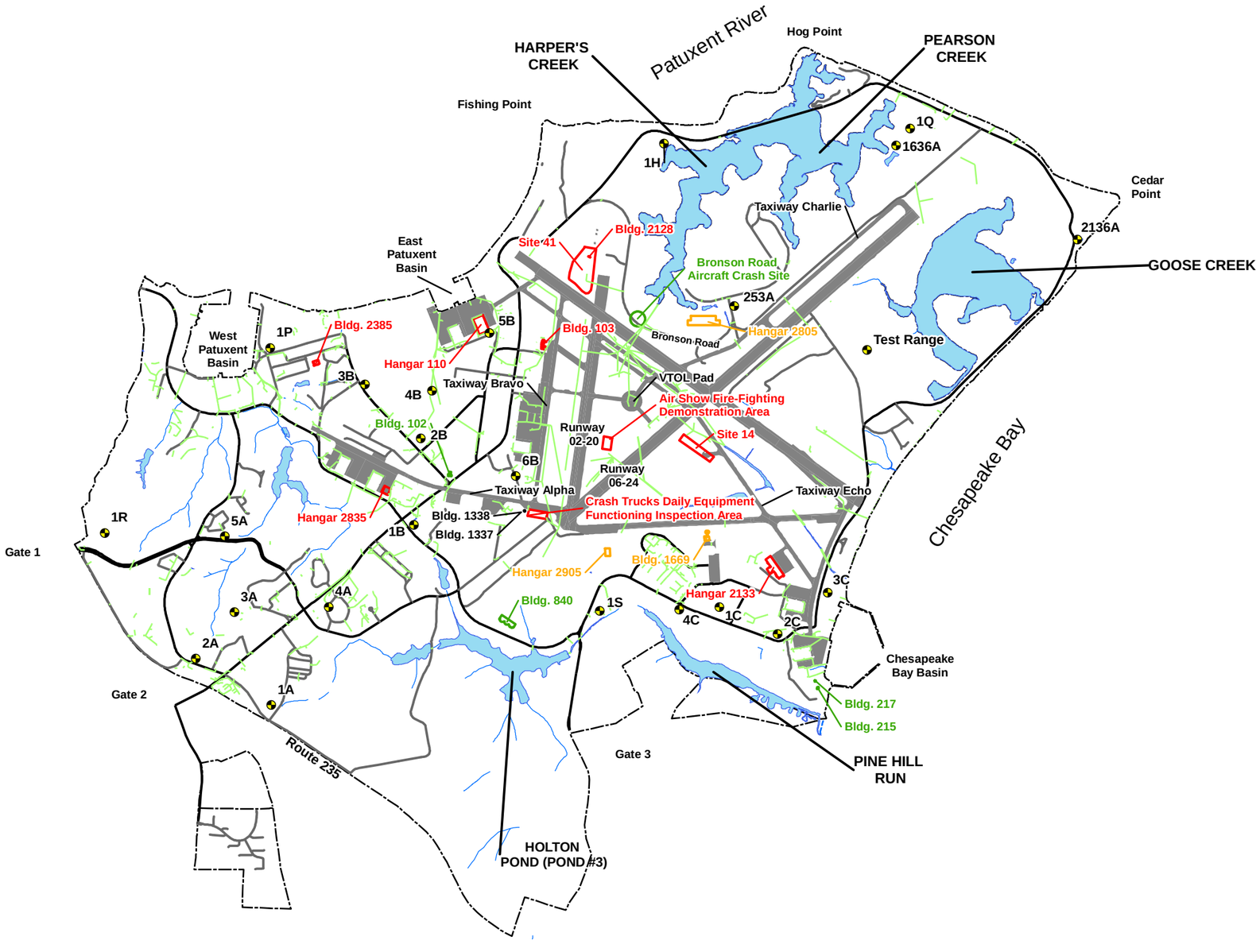
N

0 22,500 45,000
Feet

Figure 1
Naval Air Station Patuxent RiverLocation Map
Preliminary Assessment Report for PFAS
NAS Patuxent River
St. Mary's County, Maryland

ch2m

\\brookside\GIS_SHARE\ENBG\00_Proj\N\Navy\CLEAN\WASHINGTON\NASPatuxentRiver\MapFiles\663482_AFFF_Report\PFAS_Report\Figure 2A - Priority Sites and Locations.mxd cg021858 11/6/2017



Legend

- Potable Well Location
- Priority Sites and Locations
  - High Priority
  - Medium Priority
  - Low Priority
- Stream
- Stormwater
- Installation Boundary
- Water Body

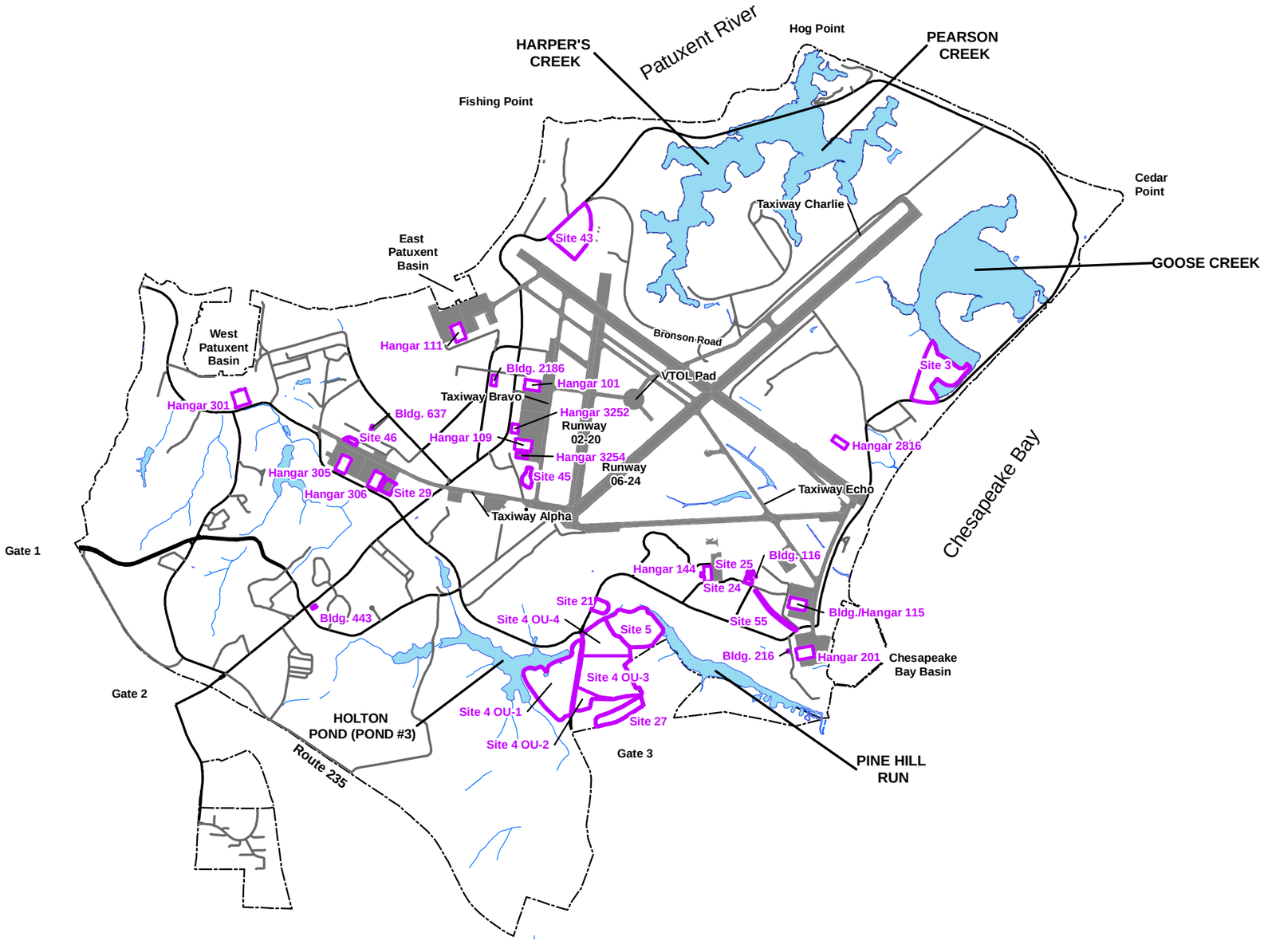
N

0 1,500 3,000 Feet

Figure 2A
Priority Sites and Locations
Preliminary Assessment Report for PFAS
NAS Patuxent River
St. Mary's County, Maryland

ch2m

\\brookside\GIS_SHARE\ENBG\00_Proj\N\Navy\CLEAN\WASHINGTON\NASPatuxentRiver\MapFiles\663482_AFFF_Report\PFAS_Report\Figure 2B - No Action Sites.mxd cg021858 11/6/2017



Legend

- No Action Sites
- Stream
- Installation Boundary
- Water Body

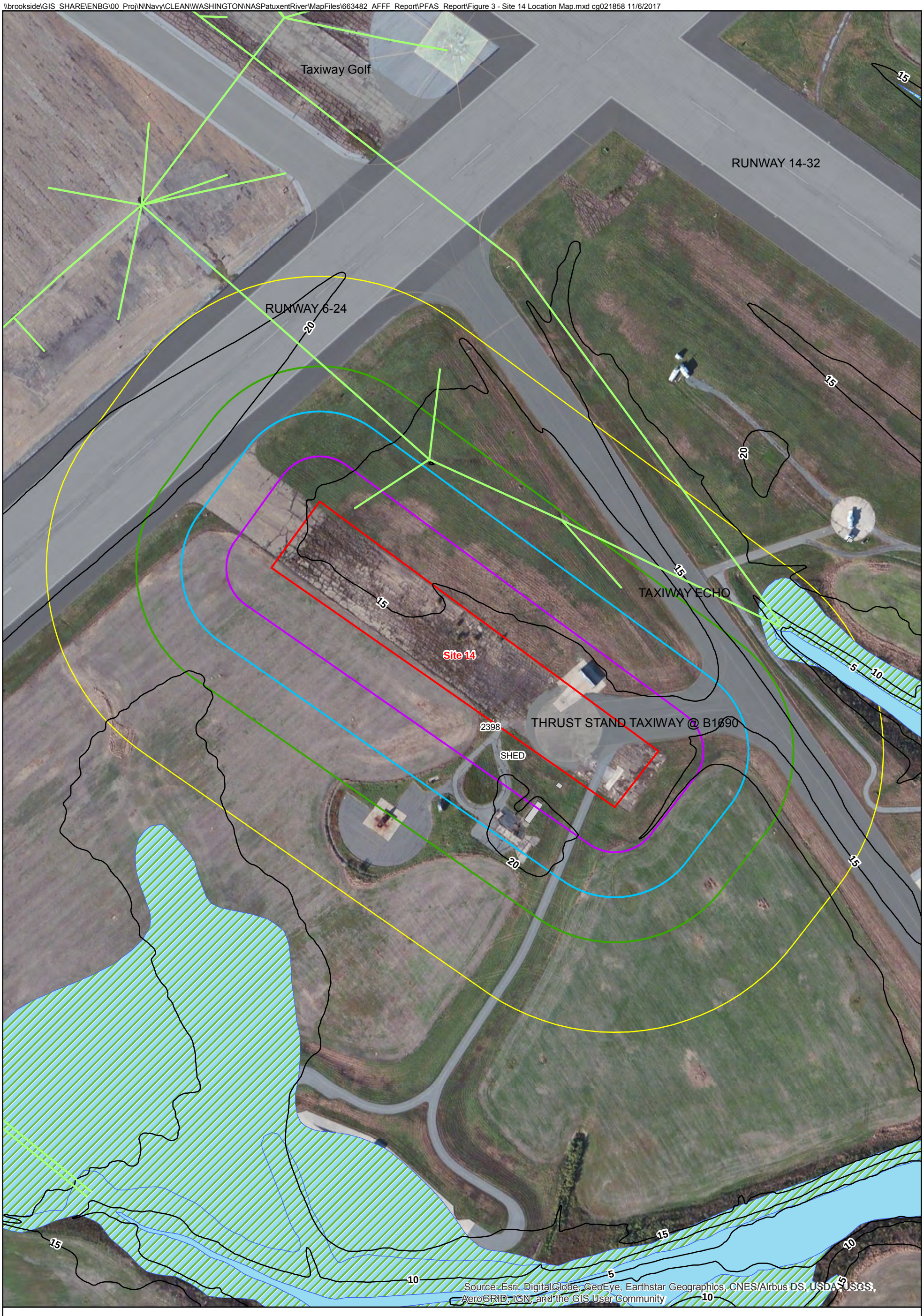
N

0 1,500 3,000 Feet

Figure 2B
No Action Sites
Preliminary Assessment Report for PFAS
NAS Patuxent River
St. Mary's County, Maryland

ch2m

\\brookside\GIS_SHARE\ENBG\00_Proj\N\Navy\CLEAN\WASHINGTON\NASPatuxentRiver\MapFiles\663482_AFFF_Report\PFAS_Report\Figure 3 - Site 14 Location Map.mxd cg021858 11/6/2017



Legend

- High Priority Site
- Building
- Installation Boundary
- Stormwater
- Priority Site Buffer 100ft
- Priority Site Buffer 200ft
- Priority Site Buffer 300ft
- Priority Site Buffer 500ft
- Elevation Contour 5 ft
- Secondary Road
- Stream
- Water Body
- Wetland Area

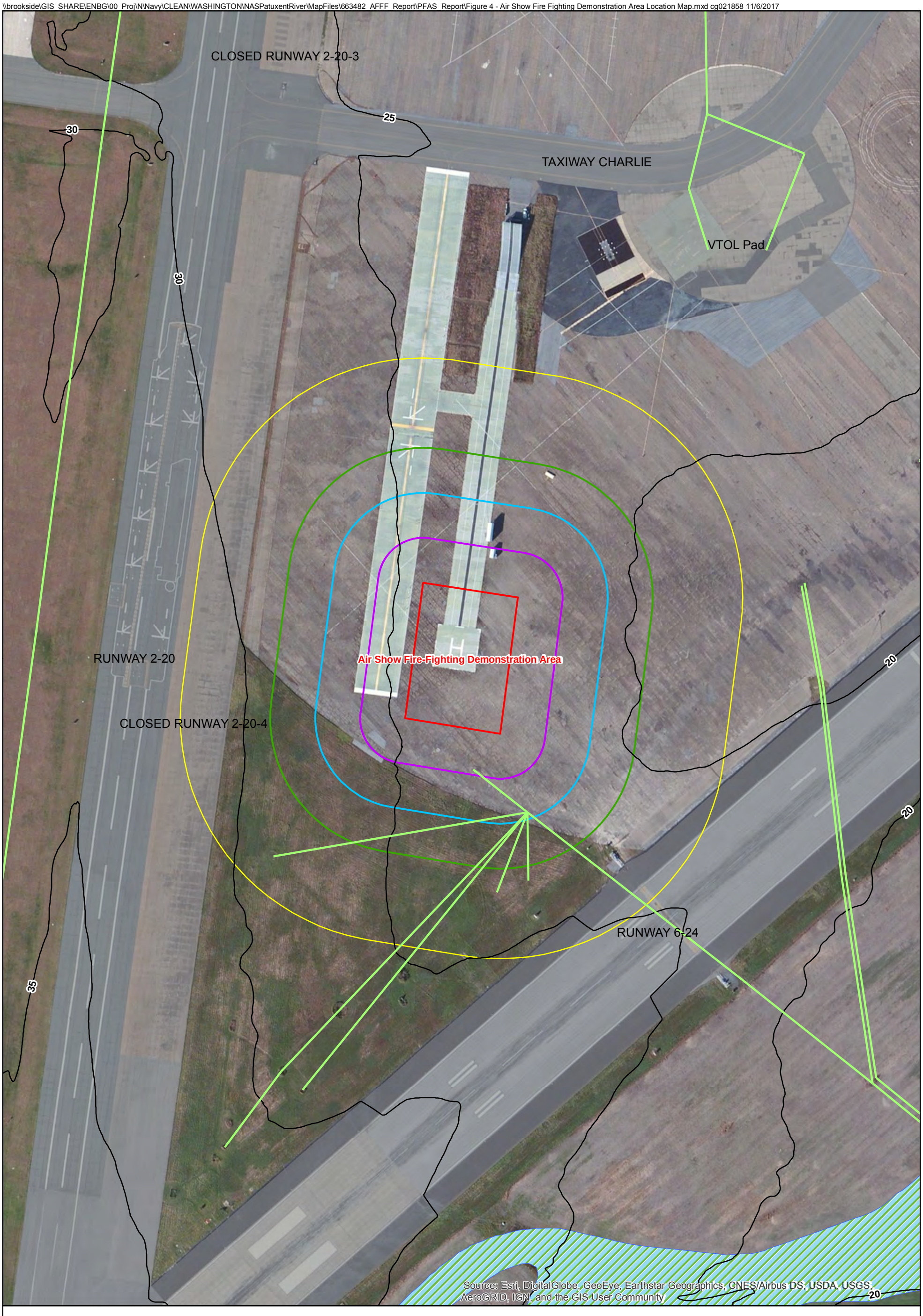
N

0 200 400 Feet

Figure 3
Site 14 Location Map
Preliminary Assessment Report for PFAS
NAS Patuxent River, St. Mary's County, Maryland

ch2m

\\brookside\GIS_SHARE\ENBG\00_Proj\N\Navy\CLEAN\WASHINGTON\NASPatuxentRiver\MapFiles\663482_AFFF_Report\PFAS_Report\Figure 4 - Air Show Fire Fighting Demonstration Area Location Map.mxd cg021858 11/6/2017



Legend

- High Priority Site
- Building
- Installation Boundary
- Stormwater
- Priority Site Buffer 100ft
- Priority Site Buffer 200ft
- Priority Site Buffer 300ft
- Priority Site Buffer 500ft
- Elevation Contour 5 ft
- Wetland Area

N

0 200 400 Feet

Figure 4
Air Show Fire Fighting Demonstration Area Location Map
Preliminary Assessment Report for PFAS
NAS Patuxent River, St. Mary's County, Maryland

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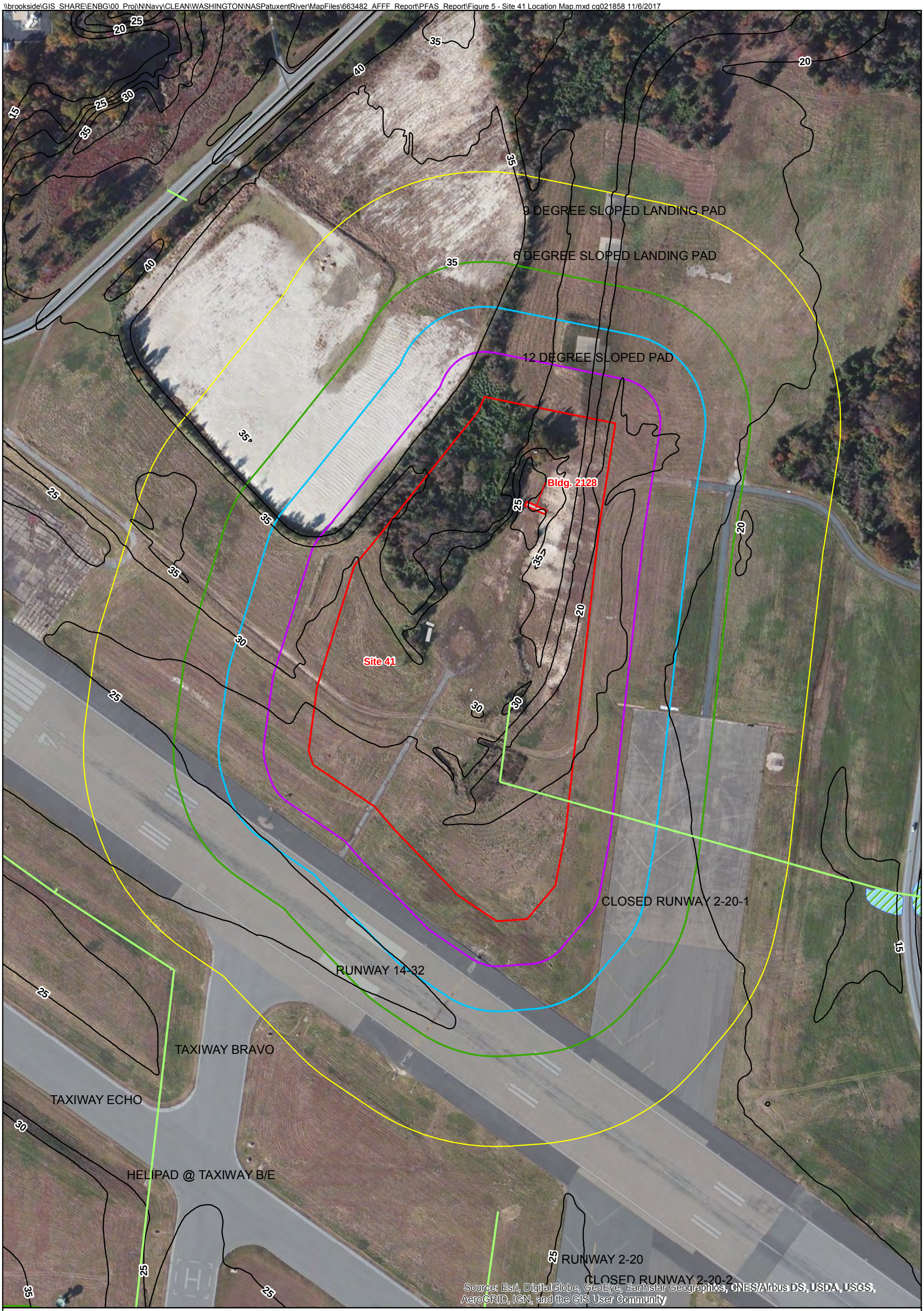
\\brookside\GIS_SHARE\ENBG\00_Proj\N\Navy\CLEAN\WASHINGTON\NASPatuxentRiver\MapFiles\663482_AFFF_Report\PFAS_Report\Figure 5 - Site 41 Location Map.mxd cg021858 11/6/2017



Legend

- High Priority Site
- Building
- Installation Boundary
- Stormwater
- Priority Site Buffer 100ft
- Priority Site Buffer 200ft
- Priority Site Buffer 300ft
- Priority Site Buffer 500ft
- Elevation Contour 5 ft
- Primary Road
- Secondary Road
- Wetland Area

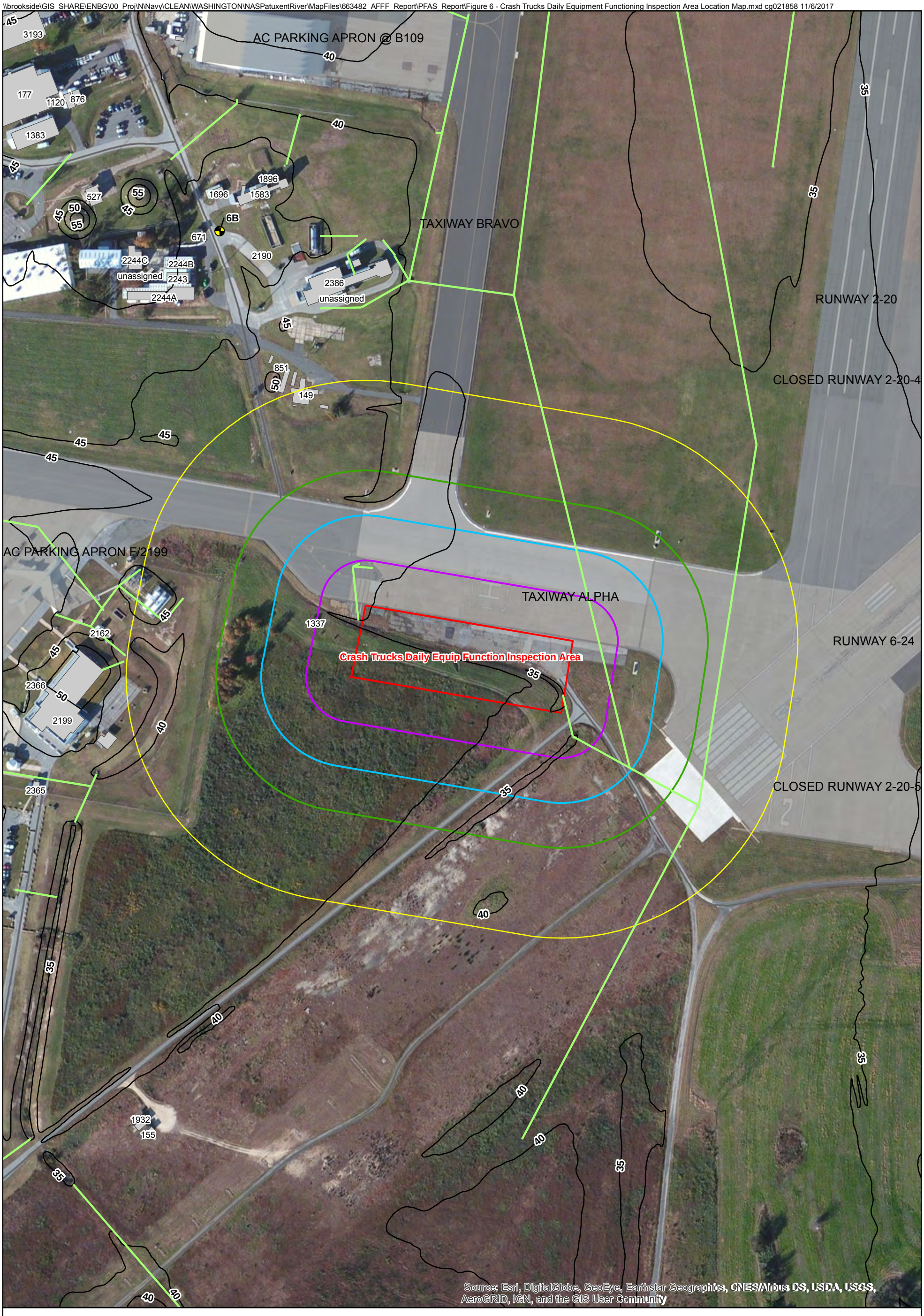
N

0 200 400 Feet

Figure 5
Site 41 Location Map
Preliminary Assessment Report for PFAS
NAS Patuxent River, St. Mary's County, Maryland

ch2m

\\brookside\GIS_SHARE\ENBG\00_Proj\N\Navy\CLEAN\WASHINGTON\NASPatuxentRiver\MapFiles\663482_AFFF_Report\PFAS_Report\Figure 6 - Crash Trucks Daily Equipment Functioning Inspection Area Location Map.mxd cg021858 11/6/2017



Legend

- Potable Well Location
- High Priority Site
- Building
- Installation Boundary
- Stormwater
- Priority Site Buffer 100ft
- Priority Site Buffer 200ft
- Priority Site Buffer 300ft
- Priority Site Buffer 500ft
- Elevation Contour 5 ft
- Secondary Road

N

0 200 400 Feet

Figure 6
Crash Trucks Daily Equipment Functioning Inspection Area Location Map
Preliminary Assessment Report for PFAS
NAS Patuxent River, St. Mary's County, Maryland

ch2m

\\brookside\GIS_SHARE\ENBG\00_Proj\N\Navy\CLEAN\WASHINGTON\NASPatuxentRiver\MapFiles\663482_AFFF_Report\PFAS_Report\Figure 7 - Building 103 Location Map.mxd cg021858 11/6/2017

Legend

- High Priority Site
- Building
- Installation Boundary
- Stormwater
- Priority Site Buffer 100ft
- Priority Site Buffer 200ft
- Priority Site Buffer 300ft
- Priority Site Buffer 500ft
- Elevation Contour 5 ft
- Primary Road
- Secondary Road

N

0 150 300 Feet

Figure 7
Building 103 Location Map
Preliminary Assessment Report for PFAS
NAS Patuxent River, St. Mary's County, Maryland

ch2m

\\brookside\GIS_SHARE\ENBG\00_Proj\N\Navy\CLEAN\WASHINGTON\NASPatuxentRiver\MapFiles\663482_AFFF_Report\PFAS_Report\Figure 8 - Building 2385 Location Map.mxd cg021858 11/6/2017

Legend

- Monitoring Well Location
- High Priority Site
- Building
- Installation Boundary
- Stormwater
- Priority Site Buffer 100ft
- Priority Site Buffer 200ft
- Priority Site Buffer 300ft
- Priority Site Buffer 500ft
- Elevation Contour 5 ft
- Primary Road
- Secondary Road
- Stream
- Water Body
- Wetland Area

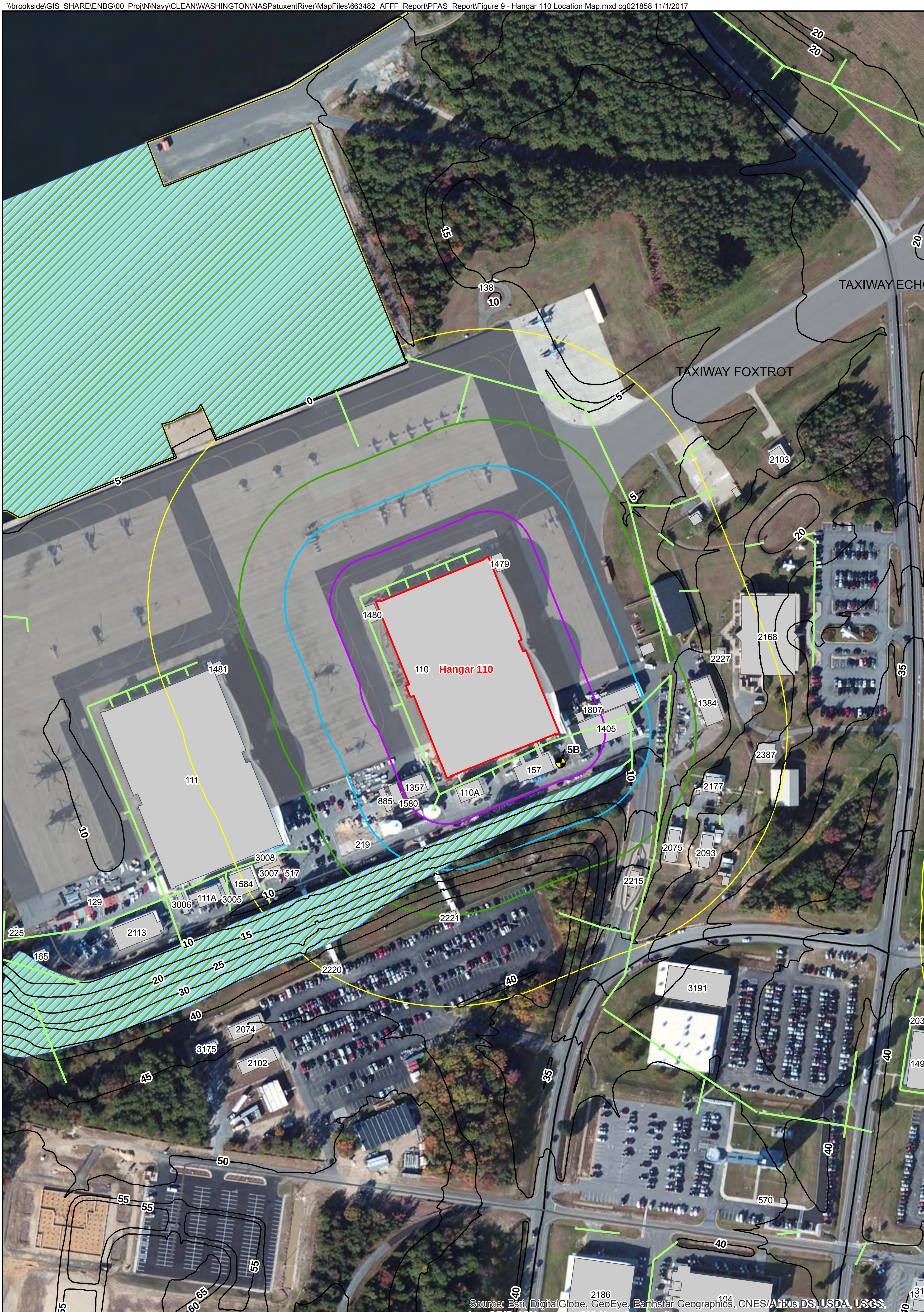
N

0 150 300 Feet

Figure 8
Building 2385 Location Map
Preliminary Assessment Report for PFAS
NAS Patuxent River, St. Mary's County, Maryland

ch2m

\\brookside\GIS_SHARE\ENBG\00_Proj\N\Navy\CLEAN\WASHINGTON\NASPatuxentRiver\MapFiles\663482_AFFF_Report\PFAS_Report\Figure 9 - Hangar 110 Location Map.mxd cg021858 11/1/2017



Legend

- Potable Well Location
- High Priority Site
- Building
- Installation Boundary
- Stormwater
- Priority Site Buffer 100ft
- Priority Site Buffer 200ft
- Priority Site Buffer 300ft
- Priority Site Buffer 500ft
- Elevation Contour 5 ft
- Primary Road
- Secondary Road
- Wetland Area

N

0 200 400 Feet

Figure 9
Hangar 110 Location Map
Preliminary Assessment Report for AFFF and PFAS
NAS Patuxent River, St. Mary's County, Maryland

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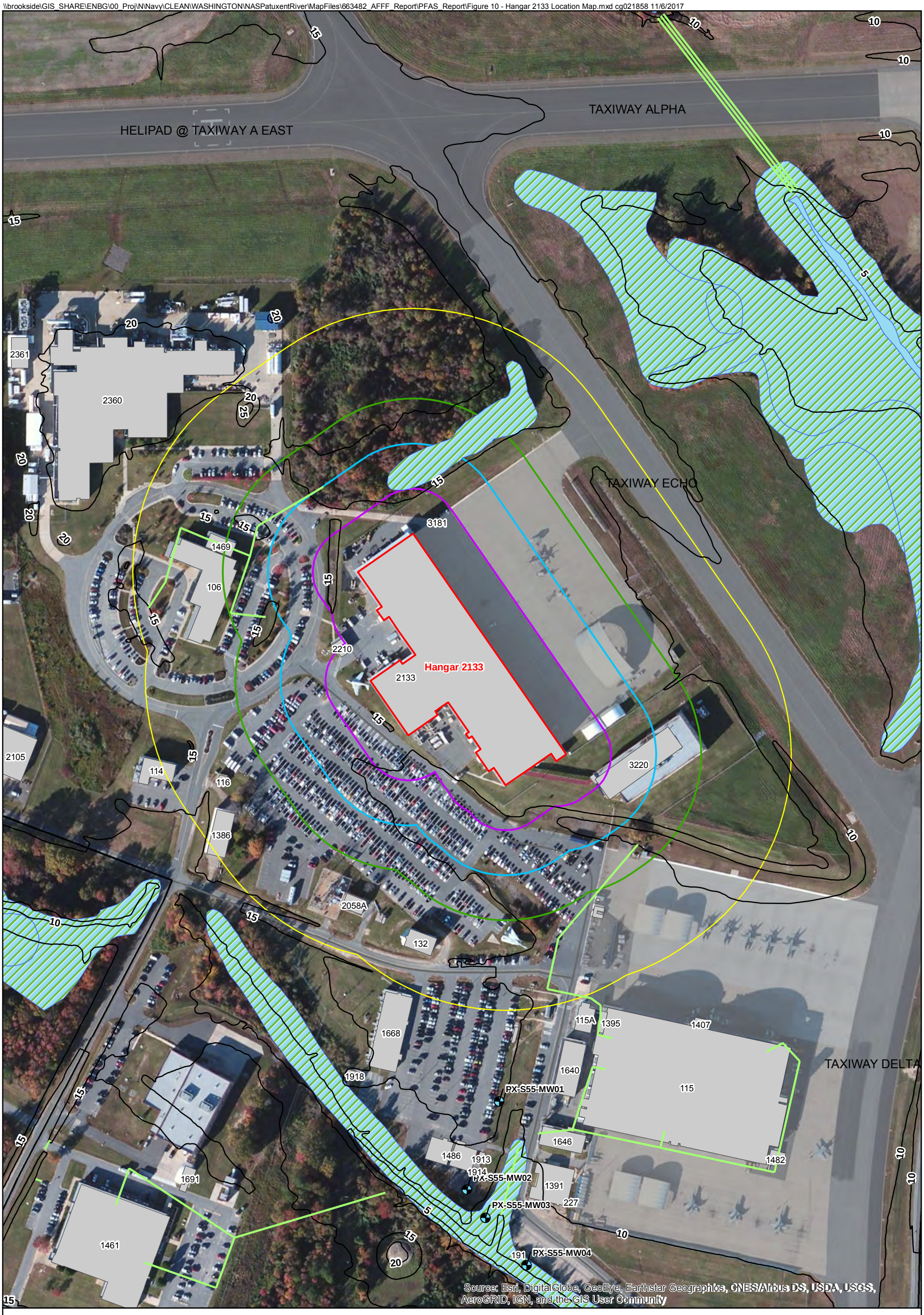
\\brookside\GIS_SHARE\ENBG\00_Proj\N\Navy\CLEAN\WASHINGTON\NASPatuxentRiver\MapFiles\663482_AFFF_Report\PFAS_Report\Figure 10 - Hangar 2133 Location Map.mxd cg021858 11/6/2017



Legend

- Monitoring Well Location
- High Priority Site
- Building
- Installation Boundary
- Stormwater
- Priority Site Buffer 100ft
- Priority Site Buffer 200ft
- Priority Site Buffer 300ft
- Priority Site Buffer 500ft
- Elevation Contour 5 ft
- Primary Road
- Secondary Road
- Water Body
- Wetland Area

N

0 200 400 Feet

Figure 10
Hangar 2133 Location Map
Preliminary Assessment Report for PFAS
NAS Patuxent River, St. Mary's County, Maryland

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\\brookside\GIS_SHARE\ENBG\00_Proj\N\Navy\CLEAN\WASHINGTON\NASPatuxentRiver\MapFiles\663482_AFFF_Report\PFAS_Report\Figure 11 - Hangar 2835 Location Map.mxd cg021858 11/1/2017

Legend

- Monitoring Well Location
- Potable Well Location
- High Priority Site
- Building
- Installation Boundary
- Stormwater
- Priority Site Buffer 100ft
- Priority Site Buffer 200ft
- Priority Site Buffer 300ft
- Priority Site Buffer 500ft
- Elevation Contour 5 ft
- Primary Road
- Secondary Road
- Stream
- Water Body
- Wetland Area

N

0 200 400 Feet

Figure 11
Hangar 2835 Location Map
Preliminary Assessment Report for AFFF and PFAS
NAS Patuxent River, St. Mary's County, Maryland

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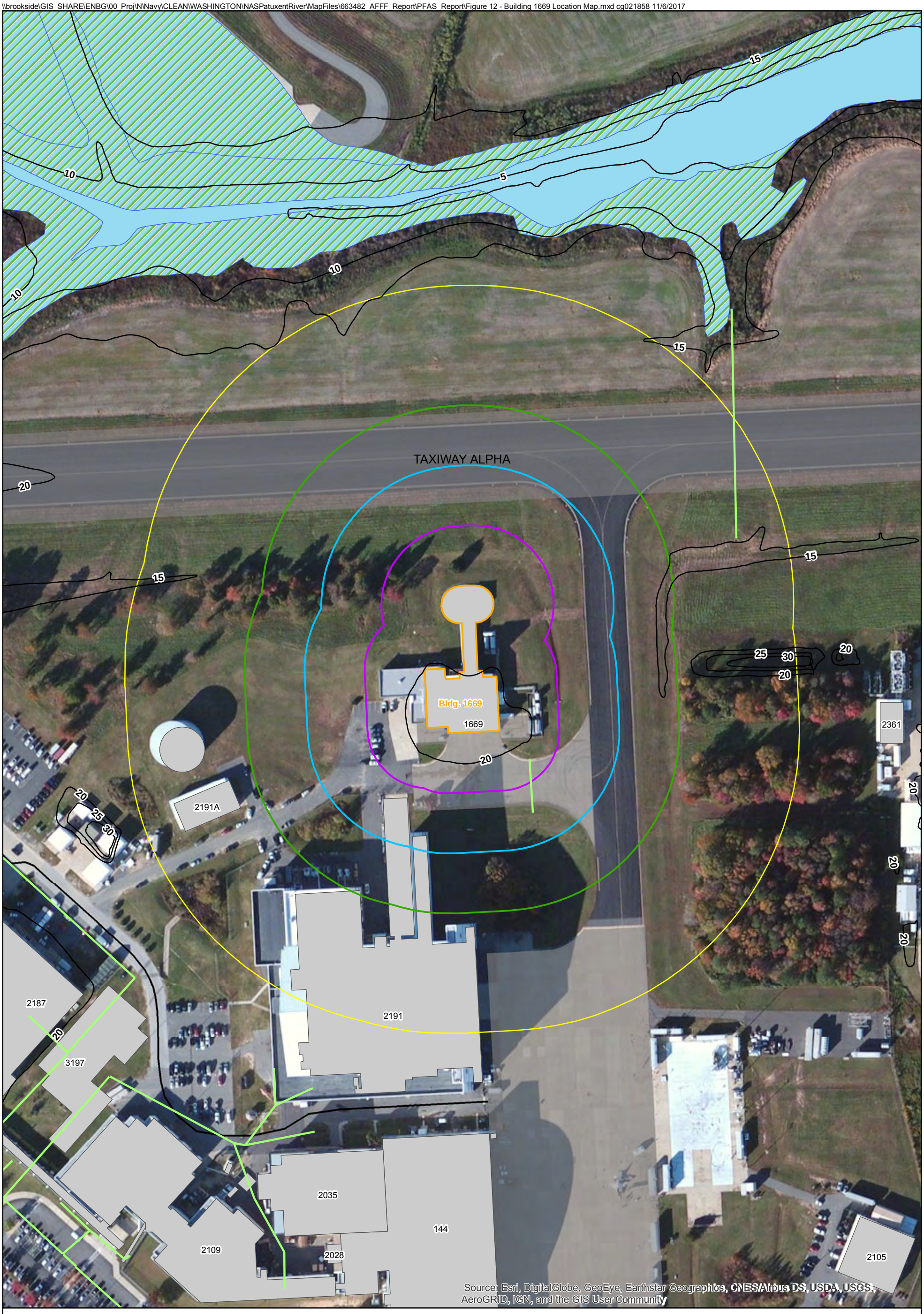
\\brookside\GIS_SHARE\ENBG\00_Proj\N\Navy\CLEAN\WASHINGTON\NASPatuxentRiver\MapFiles\663482_AFFF_Report\PFAS_Report\Figure 12 - Building 1669 Location Map.mxd cg021858 11/6/2017



Legend

- Medium Priority Site
- Building
- Installation Boundary
- Stormwater
- Priority Site Buffer 100ft
- Priority Site Buffer 200ft
- Priority Site Buffer 300ft
- Priority Site Buffer 500ft
- Elevation Contour 5 ft
- Primary Road
- Water Body
- Wetland Area

N

0 150 300 Feet

Figure 12
Building 1669 Location Map
Preliminary Assessment Report for PFAS
NAS Patuxent River, St. Mary's County, Maryland

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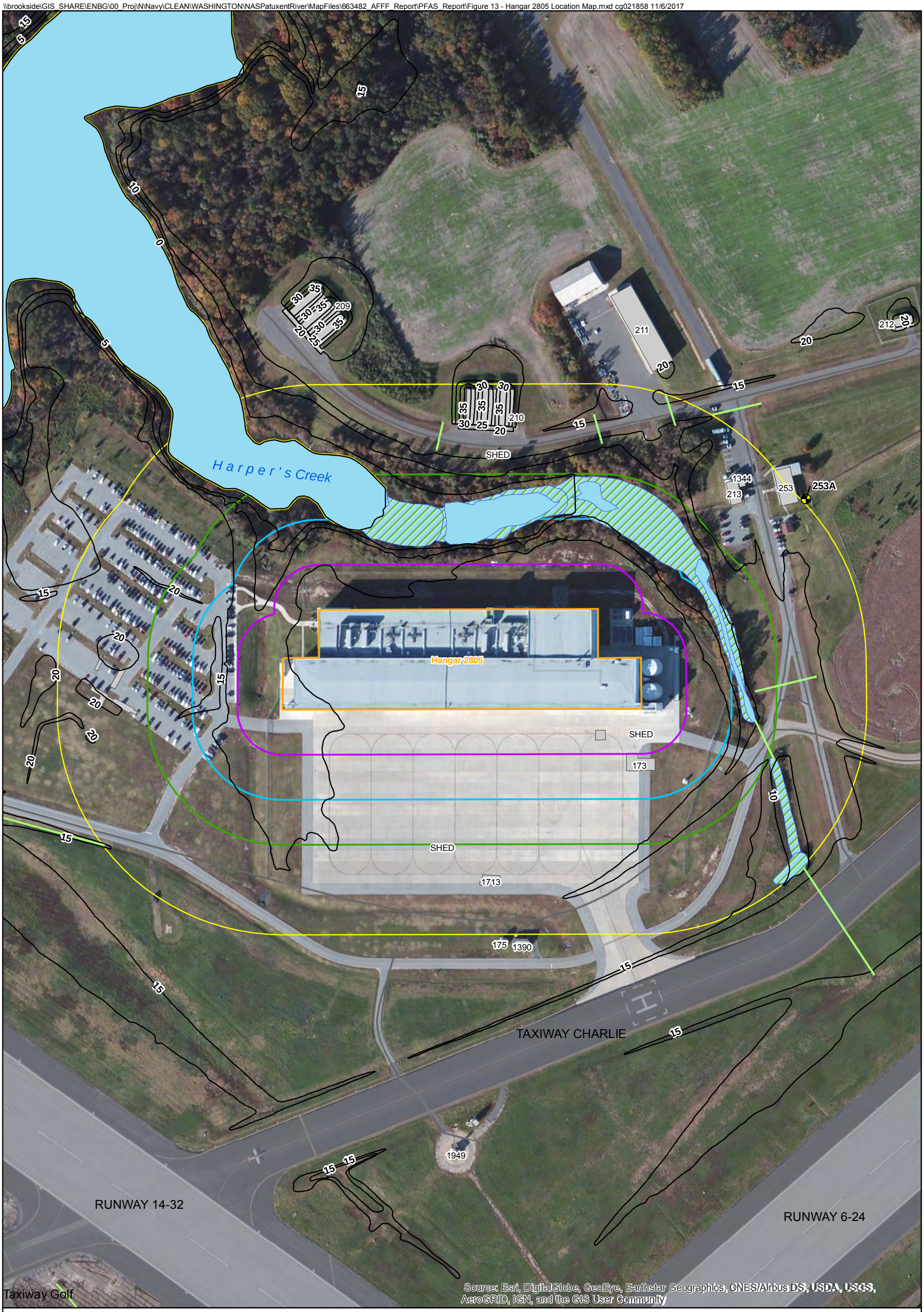
\\brookside\GIS_SHARE\ENBG\00_Proj\N\Navy\CLEAN\WASHINGTON\NASPatuxentRiver\MapFiles\663482_AFFF_Report\PFAS_Report\Figure 13 - Hangar 2805 Location Map.mxd cg021858 11/6/2017



Legend

- Potable Well Location
- Medium Priority Site
- Building
- Installation Boundary
- Stormwater
- Priority Site Buffer 100ft
- Priority Site Buffer 200ft
- Priority Site Buffer 300ft
- Priority Site Buffer 500ft
- Elevation Contour 5 ft
- Secondary Road
- Water Body
- Wetland Area

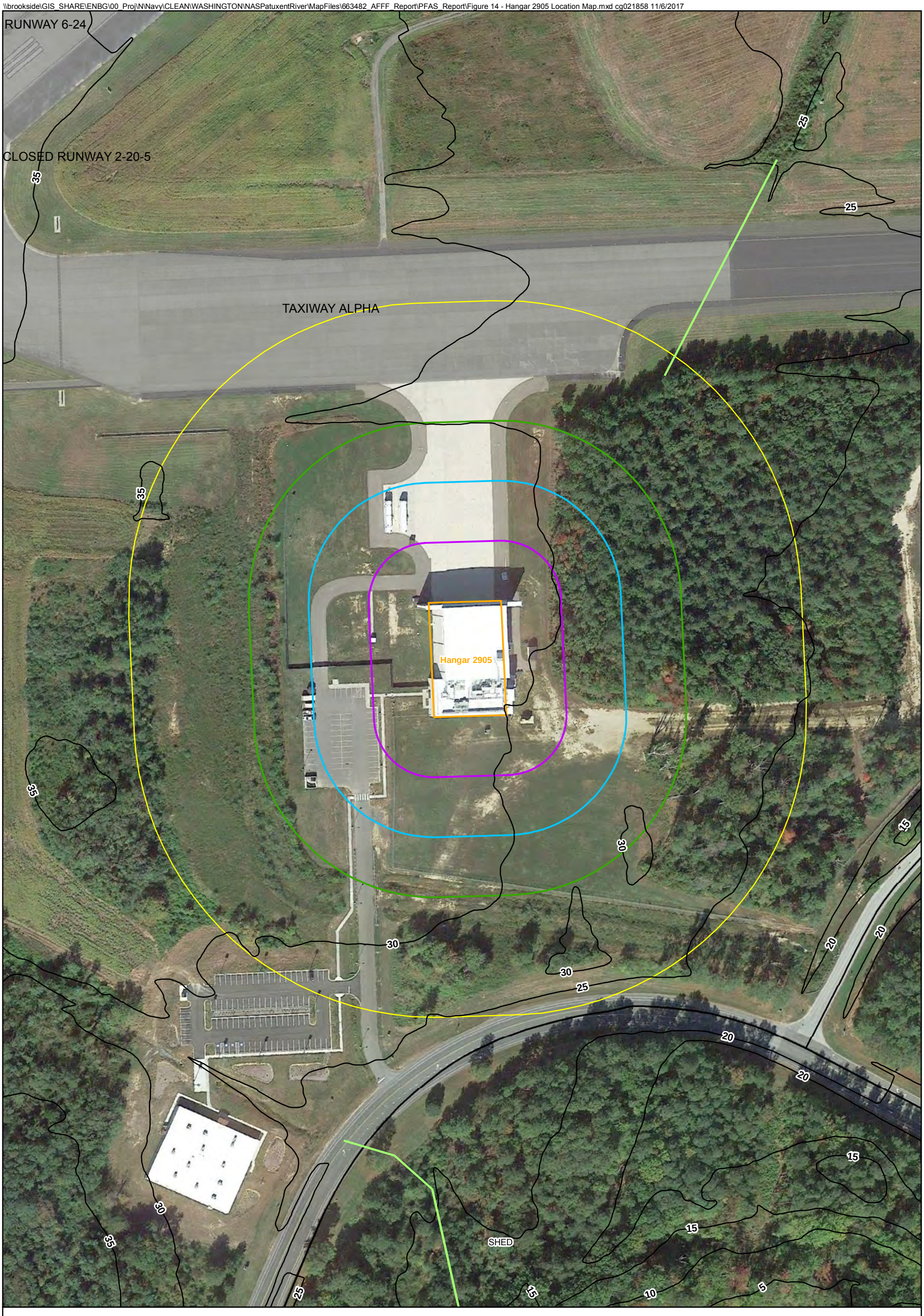
N

0 200 400 Feet

Figure 13
Hangar 2805 Location Map
Preliminary Assessment Report for PFAS
NAS Patuxent River, St. Mary's County, Maryland

ch2m

\\brookside\GIS_SHARE\ENBG\00_Proj\N\Navy\CLEAN\WASHINGTON\NASPatuxentRiver\MapFiles\663482_AFFF_Report\PFAS_Report\Figure 14 - Hangar 2905 Location Map.mxd cg021858 11/6/2017



Legend

- Medium Priority Site
- Building
- Installation Boundary
- Stormwater
- Priority Site Buffer 100ft
- Priority Site Buffer 200ft
- Priority Site Buffer 300ft
- Priority Site Buffer 500ft
- Elevation Contour 5 ft
- Primary Road
- Secondary Road

Imagery Google Earth, 2017

N

0 150 300 Feet

Figure 14
Hangar 2905 Location Map
Preliminary Assessment Report for PFAS
NAS Patuxent River, St. Mary's County, Maryland

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Appendix A
Third Unregulated Contaminant Monitoring Rule (UCMR3) Results

Appendix A

USEPA Third Unregulated Contaminant Monitoring Rule (UCMR3) PFAS Sampling Results - December 2014 and June 2015

PWSID	PWSName	FacilityName	FacilityWaterType	CollectionDate	SampleID	Contaminant	MRL	MethodID	AnalyticalResultValue
MD0180007	Lexington Park	First Colony	GW	4/13/2015	35184391005AM	PFOS	0.04	EPA 537	
MD0180007	Lexington Park	First Colony	GW	8/26/2015	35205363005AM	PFOA	0.02	EPA 537	
MD0180007	Lexington Park	First Colony	GW	4/13/2015	35184391005AM	PFBS	0.09	EPA 537	
MD0180007	Lexington Park	First Colony	GW	4/13/2015	35184391005AM	PFOA	0.02	EPA 537	
MD0180007	Lexington Park	First Colony	GW	4/13/2015	35184391005AM	PFNA	0.02	EPA 537	
MD0180007	Lexington Park	First Colony	GW	4/13/2015	35184391005AM	PFHxS	0.03	EPA 537	
MD0180007	Lexington Park	First Colony	GW	4/13/2015	35184391005AM	PFHpA	0.01	EPA 537	
MD0180007	Lexington Park	First Colony	GW	8/26/2015	35205363005AM	PFOS	0.04	EPA 537	
MD0180007	Lexington Park	First Colony	GW	8/26/2015	35205363005AM	PFHpA	0.01	EPA 537	
MD0180007	Lexington Park	First Colony	GW	8/26/2015	35205363005AM	PFBS	0.09	EPA 537	
MD0180007	Lexington Park	First Colony	GW	8/26/2015	35205363005AM	PFHxS	0.03	EPA 537	
MD0180007	Lexington Park	First Colony	GW	8/26/2015	35205363005AM	PFNA	0.02	EPA 537	
MD0180007	Lexington Park	Town Creek 3	GW	2/27/2015	35177878001AM	PFOA	0.02	EPA 537	
MD0180007	Lexington Park	Town Creek 3	GW	2/27/2015	35177878001AM	PFOS	0.04	EPA 537	
MD0180007	Lexington Park	Town Creek 3	GW	2/27/2015	35177878001AM	PFNA	0.02	EPA 537	
MD0180007	Lexington Park	Town Creek 3	GW	2/27/2015	35177878001AM	PFBS	0.09	EPA 537	
MD0180007	Lexington Park	Town Creek 3	GW	2/27/2015	35177878001AM	PFHpA	0.01	EPA 537	
MD0180007	Lexington Park	Town Creek 3	GW	8/26/2015	35205363001AM	PFOA	0.02	EPA 537	
MD0180007	Lexington Park	Town Creek 3	GW	8/26/2015	35205363001AM	PFOS	0.04	EPA 537	
MD0180007	Lexington Park	Town Creek 3	GW	8/26/2015	35205363001AM	PFNA	0.02	EPA 537	
MD0180007	Lexington Park	Town Creek 3	GW	8/26/2015	35205363001AM	PFHxS	0.03	EPA 537	
MD0180007	Lexington Park	Town Creek 3	GW	8/26/2015	35205363001AM	PFHpA	0.01	EPA 537	
MD0180007	Lexington Park	Town Creek 3	GW	8/26/2015	35205363001AM	PFBS	0.09	EPA 537	
MD0180007	Lexington Park	Town Creek 3	GW	2/27/2015	35177878001AM	PFHxS	0.03	EPA 537	
MD0180007	Lexington Park	Wildewood 1	GW	8/26/2015	35205363003AM	PFOA	0.02	EPA 537	
MD0180007	Lexington Park	Wildewood 1	GW	4/13/2015	35184391003AM	PFHxS	0.03	EPA 537	
MD0180007	Lexington Park	Wildewood 1	GW	8/26/2015	35205363003AM	PFOA	0.02	EPA 537	
MD0180007	Lexington Park	Wildewood 1	GW	4/13/2015	35184391003AM	PFHxS	0.03	EPA 537	
MD0180007	Lexington Park	Wildewood 1	GW	4/13/2015	35184391003AM	PFHpA	0.01	EPA 537	
MD0180007	Lexington Park	Wildewood 1	GW	4/13/2015	35184391003AM	PFOS	0.04	EPA 537	
MD0180007	Lexington Park	Wildewood 1	GW	4/13/2015	35184391003AM	PFNA	0.02	EPA 537	
MD0180007	Lexington Park	Wildewood 1	GW	4/13/2015	35184391003AM	PFOA	0.02	EPA 537	
MD0180007	Lexington Park	Wildewood 1	GW	4/13/2015	35184391003AM	PFBS	0.09	EPA 537	
MD0180007	Lexington Park	Wildewood 1	GW	8/26/2015	35205363003AM	PFOS	0.04	EPA 537	
MD0180007	Lexington Park	Wildewood 1	GW	8/26/2015	35205363003AM	PFNA	0.02	EPA 537	
MD0180007	Lexington Park	Wildewood 1	GW	8/26/2015	35205363003AM	PFHpA	0.01	EPA 537	
MD0180007	Lexington Park	Wildewood 1	GW	8/26/2015	35205363003AM	PFBS	0.09	EPA 537	
MD0180007	Lexington Park	Wildewood 1	GW	8/26/2015	35205363003AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 532 (Well 532B - 1P)	GW	12/15/2014	35168731015AM	PFNA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 532 (Well 532B - 1P)	GW	12/15/2014	35168731015AM	PFOS	0.04	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 532 (Well 532B - 1P)	GW	12/15/2014	35168731015AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 532 (Well 532B - 1P)	GW	12/15/2014	35168731015AM	PFHpA	0.01	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 532 (Well 532B - 1P)	GW	12/15/2014	35168731015AM	PFOA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 532 (Well 532B - 1P)	GW	12/15/2014	35168731015AM	PFBS	0.09	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 584 (Well 4A)	GW	12/15/2014	35168731017AM	PFBS	0.09	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 587 (Well 5A)	GW	12/15/2014	35168731011AM	PFHpA	0.01	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 584 (Well 4A)	GW	12/15/2014	35168731017AM	PFHpA	0.01	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 584 (Well 4A)	GW	12/15/2014	35168731017AM	PFNA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 584 (Well 4A)	GW	12/15/2014	35168731017AM	PFOS	0.04	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 584 (Well 4A)	GW	12/15/2014	35168731017AM	PFOA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 584 (Well 4A)	GW	12/15/2014	35168731017AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 587 (Well 5A)	GW	12/15/2014	35168731011AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 587 (Well 5A)	GW	6/30/2015	35195985011AM	PFOA	0.02	EPA 537	

Appendix A
USEPA Third Unregulated Contaminant Monitoring Rule (UCMR3) PFAS Sampling Results - December 2014 and June 2015

PWSID	PWSName	FacilityName	FacilityWaterType	CollectionDate	SampleID	Contaminant	MRL	MethodID	AnalyticalResultValue
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 587 (Well 5A)	GW	6/30/2015	35195985011AM	PFOS	0.04	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 587 (Well 5A)	GW	6/30/2015	35195985011AM	PFNA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 587 (Well 5A)	GW	6/30/2015	35195985011AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 587 (Well 5A)	GW	6/30/2015	35195985011AM	PFHpA	0.01	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 587 (Well 5A)	GW	6/30/2015	35195985011AM	PFBS	0.09	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 587 (Well 5A)	GW	12/15/2014	35168731011AM	PFBS	0.09	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 587 (Well 5A)	GW	12/15/2014	35168731011AM	PFOA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 587 (Well 5A)	GW	12/15/2014	35168731011AM	PFNA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 587 (Well 5A)	GW	12/15/2014	35168731011AM	PFOS	0.04	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 527 (Well 6B)	GW	12/15/2014	35168731013AM	PFOA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 527 (Well 6B)	GW	12/15/2014	35168731013AM	PFBS	0.09	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 527 (Well 6B)	GW	12/15/2014	35168731013AM	PFHpA	0.01	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 527 (Well 6B)	GW	12/15/2014	35168731013AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 527 (Well 6B)	GW	12/15/2014	35168731013AM	PFOS	0.04	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 527 (Well 6B)	GW	12/15/2014	35168731013AM	PFNA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 584 (Well 4A)	GW	6/30/2015	35195985013AM	PFOA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 584 (Well 4A)	GW	6/30/2015	35195985013AM	PFOS	0.04	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 584 (Well 4A)	GW	6/30/2015	35195985013AM	PFNA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 584 (Well 4A)	GW	6/30/2015	35195985013AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 584 (Well 4A)	GW	6/30/2015	35195985013AM	PFHpA	0.01	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 584 (Well 4A)	GW	6/30/2015	35195985013AM	PFBS	0.09	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 529 (Well 1B)	GW	6/30/2015	35195985015AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 529 (Well 1B)	GW	6/30/2015	35195985015AM	PFNA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 529 (Well 1B)	GW	6/30/2015	35195985015AM	PFHpA	0.01	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 529 (Well 1B)	GW	6/30/2015	35195985015AM	PFBS	0.09	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 529 (Well 1B)	GW	6/30/2015	35195985015AM	PFOA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 529 (Well 1B)	GW	6/30/2015	35195985015AM	PFOS	0.04	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 529 (Well 1B)	GW	12/15/2014	35168731019AM	PFOS	0.04	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 529 (Well 1B)	GW	12/15/2014	35168731019AM	PFHpA	0.01	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 529 (Well 1B)	GW	12/15/2014	35168731019AM	PFOA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 529 (Well 1B)	GW	12/15/2014	35168731019AM	PFBS	0.09	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 529 (Well 1B)	GW	12/15/2014	35168731019AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 529 (Well 1B)	GW	12/15/2014	35168731019AM	PFNA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 526 (Wells 530, 531 & 2276)	GW	12/15/2014	35168731003AM	PFOS	0.04	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 526 (Wells 530, 531 & 2276)	GW	6/30/2015	35195985003AM	PFBS	0.09	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 526 (Wells 530, 531 & 2276)	GW	6/30/2015	35195985003AM	PFHpA	0.01	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 526 (Wells 530, 531 & 2276)	GW	6/30/2015	35195985003AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 526 (Wells 530, 531 & 2276)	GW	6/30/2015	35195985003AM	PFNA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 526 (Wells 530, 531 & 2276)	GW	6/30/2015	35195985003AM	PFOS	0.04	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 526 (Wells 530, 531 & 2276)	GW	6/30/2015	35195985003AM	PFOA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 526 (Wells 530, 531 & 2276)	GW	12/15/2014	35168731003AM	PFHpA	0.01	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 526 (Wells 530, 531 & 2276)	GW	12/15/2014	35168731003AM	PFNA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 526 (Wells 530, 531 & 2276)	GW	12/15/2014	35168731003AM	PFOA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 526 (Wells 530, 531 & 2276)	GW	12/15/2014	35168731003AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 526 (Wells 530, 531 & 2276)	GW	12/15/2014	35168731003AM	PFBS	0.09	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 574 (Well 3A)	GW	12/15/2014	35168731005AM	PFOA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Pump Station A (Wells 522 & 524)	GW	12/15/2014	35168731001AM	PFNA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Pump Station A (Wells 522 & 524)	GW	12/15/2014	35168731001AM	PFOS	0.04	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Pump Station A (Wells 522 & 524)	GW	12/15/2014	35168731001AM	PFHpA	0.01	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Pump Station A (Wells 522 & 524)	GW	12/15/2014	35168731001AM	PFBS	0.09	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Pump Station A (Wells 522 & 524)	GW	6/30/2015	35195985001AM	PFOS	0.04	EPA 537	

Appendix A
USEPA Third Unregulated Contaminant Monitoring Rule (UCMR3) PFAS Sampling Results - December 2014 and June 2015

PWSID	PWSName	FacilityName	FacilityWaterType	CollectionDate	SampleID	Contaminant	MRL	MethodID	AnalyticalResultValue
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 574 (Well 3A)	GW	12/15/2014	35168731005AM	PFBS	0.09	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Pump Station A (Wells 522 & 524)	GW	12/15/2014	35168731001AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Pump Station A (Wells 522 & 524)	GW	6/30/2015	35195985001AM	PFOA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Pump Station A (Wells 522 & 524)	GW	6/30/2015	35195985001AM	PFNA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Pump Station A (Wells 522 & 524)	GW	6/30/2015	35195985001AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Pump Station A (Wells 522 & 524)	GW	6/30/2015	35195985001AM	PFHpA	0.01	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Pump Station A (Wells 522 & 524)	GW	6/30/2015	35195985001AM	PFBS	0.09	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Pump Station A (Wells 522 & 524)	GW	12/15/2014	35168731001AM	PFOA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 583 (Well 3C)	GW	12/15/2014	35168731009AM	PFOA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 583 (Well 3C)	GW	12/15/2014	35168731009AM	PFHpA	0.01	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 583 (Well 3C)	GW	12/15/2014	35168731009AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 528 (1C, 2C & 4C)	GW	6/30/2015	35195985007AM	PFOS	0.04	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 574 (Well 3A)	GW	12/15/2014	35168731005AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 583 (Well 3C)	GW	6/30/2015	35195985009AM	PFNA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 583 (Well 3C)	GW	12/15/2014	35168731009AM	PFBS	0.09	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 583 (Well 3C)	GW	6/30/2015	35195985009AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 583 (Well 3C)	GW	6/30/2015	35195985009AM	PFOS	0.04	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 583 (Well 3C)	GW	6/30/2015	35195985009AM	PFOA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 583 (Well 3C)	GW	6/30/2015	35195985009AM	PFBS	0.09	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 583 (Well 3C)	GW	6/30/2015	35195985009AM	PFHpA	0.01	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 583 (Well 3C)	GW	12/15/2014	35168731009AM	PFOS	0.04	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 583 (Well 3C)	GW	12/15/2014	35168731009AM	PFNA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 574 (Well 3A)	GW	6/30/2015	35195985005AM	PFOA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 574 (Well 3A)	GW	6/30/2015	35195985005AM	PFBS	0.09	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 574 (Well 3A)	GW	6/30/2015	35195985005AM	PFHpA	0.01	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 574 (Well 3A)	GW	6/30/2015	35195985005AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 574 (Well 3A)	GW	6/30/2015	35195985005AM	PFNA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 574 (Well 3A)	GW	6/30/2015	35195985005AM	PFOS	0.04	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 574 (Well 3A)	GW	12/15/2014	35168731005AM	PFNA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 574 (Well 3A)	GW	12/15/2014	35168731005AM	PFOS	0.04	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 528 (1C, 2C & 4C)	GW	12/15/2014	35168731007AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 528 (1C, 2C & 4C)	GW	6/30/2015	35195985007AM	PFHpA	0.01	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 528 (1C, 2C & 4C)	GW	6/30/2015	35195985007AM	PFNA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 528 (1C, 2C & 4C)	GW	6/30/2015	35195985007AM	PFOA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 528 (1C, 2C & 4C)	GW	6/30/2015	35195985007AM	PFHxS	0.03	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 528 (1C, 2C & 4C)	GW	6/30/2015	35195985007AM	PFBS	0.09	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 528 (1C, 2C & 4C)	GW	12/15/2014	35168731007AM	PFBS	0.09	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 528 (1C, 2C & 4C)	GW	12/15/2014	35168731007AM	PFHpA	0.01	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 528 (1C, 2C & 4C)	GW	12/15/2014	35168731007AM	PFOA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 528 (1C, 2C & 4C)	GW	12/15/2014	35168731007AM	PFNA	0.02	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 574 (Well 3A)	GW	12/15/2014	35168731005AM	PFHpA	0.01	EPA 537	
MD0180022	Patuxent Naval Air Station (NAWCAD)	Building 528 (1C, 2C & 4C)	GW	12/15/2014	35168731007AM	PFOS	0.04	EPA 537	

Appendix B
Completed Questionnaires

11/4/2016
AFFF Research Interview
Interviewer: Heidi Morgan
Interviewee: Donald Ervin (Hollywood, MD) Retired Pax Station Fire Chief

Pax tenure – 1968 – 1991

The first time he used AFFF was to put out an erupted fuel cell on an F-8 behind H201 (near the firing tunnel) in December 1970. The area is marked on the map.

AFFF was not used to foam runways. Runways were foamed but using protein foam. Foaming of the runways was stopped in 1970.

He stated that AFFF was first used when they got new fire trucks around early 1970’s. (The new trucks were yellow the old one were red and were not equipped for AFFF use. The old pictures may reveal the colors.

Review of the Historical Use of AFFFs and Potential Release of PFCs
NAS Patuxent River and Webster Field Annex

Introduction: The purpose of this survey is to determine the possible environmental releases or storage of AFFFs at NAS Patuxent River and Webster Field Annex, and to determine whether a follow-up interview is needed to obtain further information. The survey and interview will help us identify and document locations (i.e., sites) where PFC releases may have occurred. The information collected will be evaluated to determine if the site warrants further investigation, including soil or groundwater sampling.

This form is voluntary and any information you provide will be used strictly to evaluate the need for further site investigation. Please respond to all questions you are able to answer, in part or in whole. Please leave cells blank if an answer cannot be provided.

Your time and expertise are greatly appreciated.

Date/Time of Interview: Tuesday, Sept. 27 09:00	**Work Location (Installation/Building/Area):** NAS Patuxent River Bldg. 504		
Interviewee Name:	**Position/Job Title:** Environmental Protection Specialist		
How many years at current position: 13	**Phone/Email:**		
1. What types of firefighting foams are currently used at the installation?	3% AFFF NAS Patuxent River	6% AFFF Select an installation	High Expansion Foam Select an installation
	Other; please list:		
2. What manufacturer's AFFF products are currently used at the installation?	3M ☑	Ansul ☐	Chemguard ☑
	Other; please list:		
3. Where are the AFFF solutions currently stored, transferred, or handled at the installation? Please describe.	Bldgs.: 110, 1669, 2133, 2385, 2805, 2816, 2835, 2905, and 3254		
4. Is there a secondary containment in the AFFF storage area(s)?	Yes ☑ No ☐		
	Additional information: Bldgs.: 110, 1669, 2133, 2385, 2805, 2816, and 2905		
5. Are your automated fire suppression systems currently fitted for AFFF or have they been retrofitted for use of high expansion foam?	☑ Currently fitted for AFFF ☐ Retrofitted for use of high expansion foam		

(Question 5 continued)	Additional information:
6. Do you have an inventory of the amount of AFFF currently stored on the installation(s) or present in the automated fire suppression systems?	Yes ☐ No ☐ Additional information: Unknown
7. Can you describe the procedure for how the suppression systems are supplied with AFFF?	
8. Have there been inadvertent releases of AFFF from hangar fire suppression systems within recent years? a) If yes, provide the time frame, and the b) estimated location of the release	Yes ☑ No ☐ Year Month Select a month Location of release: More than 1/2 mile from shore or base boundary Additional information: 01/24/2014 - Bldg. 2835 02/22/2015 - Bldg. 2835 02/22/2015 - Bldg. 2805 10/08/2015 - Bldg. 2835 03/05/2016 - Bldg. 2385
9. How are the discharges handled? (i.e. when the suppression system goes off)? Please describe.	Contracted remediation teams collect discharged product, and the product is disposed of per regulatory standards.
10. Provide a list of trucks and trailers currently carrying AFFF and where they are parked/stored? Use the "additional information" box to add more numbers or elaborate if needed.	Identify Truck/Trailer: / Location: 1. / 1. Location 2. / 2. Location 3. / 3. Location 4. / 4. Location Additional information:

11. Approximately how much AFFF (gallons) is carried/stored in the specified trucks/trailers?	Number of Gallons: 1. 2. 3. 4.
12. Are the truck(s) tested for spray patterns to make sure the equipment is working properly?	Yes ☐ No ☐ Additional information:
13. Is AFFF used during spray pattern testing or are foam distribution test kits used to eliminate AFFF waste stream?	☐ AFFF is used ☐ Foam distribution test kit is used
14. If AFFF is used during spray pattern testing, please describe the procedures used to contain and/or clean up the AFFF after release.	
15. How often are these spray tests performed?	Spray test frequency: Select one Additional information:
16. Can you provide the locations of these spray tests?	
17. Can you describe the procedure for how trucks and trailers are supplied with AFFF, and where this resupply occurs?	
18. Can you provide the procedures for how these vehicles are currently cleaned/decontaminated?	

19. When AFFF was used during a fire training exercise, how was the AFFF cleaned up and disposed of?		
20. Do you have recollection or records of AFFF being used? a) If yes, please indicate if they were used in response to the following:	Yes ☐ No ☐	
	Select one	
	Additional information:	
21. If no written records or incomplete written records are available, do you have anecdotal/verbal information and locations of spills or other emergency response incidents where AFFF was used? Please provide the approximate date, location, and a brief description of the incident(s).	1. Date Location Description	
	2. Date Location Description	
	3. Date Location Description	
	4. Date Location Description	
22. Identify all Fire-Training Areas (FTAs) which currently or historically used AFFF.	Identify FTA Location	Current/Historic?
	1. Location	1. Select one
	2. Location	2. Select one
	3. Location	3. Select one
	4. Location	4. Select one

23. For the FTAs identified above, please indicate: a) The years of operation or date range. b) The date when fire training at each FTA was last conducted.	Date Range: 1. 2. 3. 4.	Last Fire Training: 1. 2. 3. 4.
24. Do you have information on how many gallons of AFFF were released in these FTAs?	Number of Gallons 1. 2. 3. 4.	
25. What types of fuels/flammables were used at each FTA?	Fuel Type 1. 2. 3. 4.	
26. Was remedial action conducted at these FTAs? a) If "Yes", please describe the remedial action. b) Indicate the year remedial action was conducted, if known. c) Indicate whether or not a new FTA was constructed on top of the original FTA following remediation in the "Additional Information" section.	Yes ☐ Year No ☐ Additional Information:	
27. What are the current fire-fighting training practices at this installation? Please describe.		
28. What are the **non-FTA locations** where AFFF suppression systems are installed or AFFF/PFCs stored or used or disposed (i.e. hangars, fire stations, maintenance areas, wastewater treatment plants, metal plating facilities, AFFF ponds/lagoons, and/or aerospace, automotive, electronic facilities)	Identify Non-FTA Location (site/building number/description) 1. Location 2. Location 3. Location 4. Location	

29. Do these location(s) currently contain or have they historically contained AFFF/PFCs? a) If yes, please indicate the years/date range each location contained AFFF/PFCs.	Years or Date Range 1. Select one 2. Select one 3. Select one 4. Select one Additional information:
30. If applicable, when was the system at this **Non-FTA** converted from an AFFF to a high expansion foam? a) Indicate year of conversion.	Year of Conversion to High Expansion Foam 1. 2. 3. 4. Additional information:
31. Is there a metal plating/electroplating shop on base? a) If yes, please indicate the years of operation or date range.	Yes ☐ No ☐ Years of operation and additional information:
32. Is there anyone else or other base organization personnel that you would recommend we interview? If so, please list.	1. Mr. 2. First Last 3. First Last 4. First Last

Thank you for your participation!

Review of the Historical Use of AFFFs and Potential Release of PFCs
NAS Patuxent River and Webster Field Annex

Introduction: The purpose of this survey is to determine the possible environmental releases or storage of AFFFs at NAS Patuxent River and Webster Field Annex, and to determine whether a follow-up interview is needed to obtain further information. The survey and interview will help us identify and document locations (i.e., sites) where PFC releases may have occurred. The information collected will be evaluated to determine if the site warrants further investigation, including soil or groundwater sampling.

This form is voluntary and any information you provide will be used strictly to evaluate the need for further site investigation. Please respond to all questions you are able to answer, in part or in whole. Please leave cells blank if an answer cannot be provided.

Your time and expertise are greatly appreciated.

Date/Time of Interview: Monday, Sept. 26 13:00	**Work Location (Installation/Building/Area):** NAS Patuxent River 504
Interviewee Name: Mr.	**Position/Job Title:** Stormwatwer Program Manager
How many years at current position:	**Phone/Email:**

1. What types of firefighting foams are currently used at the installation?	3% AFFF NAS Patuxent River	6% AFFF NAS Patuxent River	High Expansion Foam Select an installation
	Other; please list:		
2. What manufacturer's AFFF products are currently used at the installation?	3M ☑	Ansul ☐	Chemguard ☐
	Other; please list:		
3. Where are the AFFF solutions currently stored, transferred, or handled at the installation? Please describe.	3% stored at HAZMAT facility bldg 2385, 6% at the Hangars 2133, 2805 and 2185 at PAx but Spills Mgr and Wasteater Mgr may know more locations		
4. Is there a secondary containment in the AFFF storage area(s)?	Yes ☑ No ☐		
	Additional information: The locations at 2385 , 2133., 2805 have secondary containment BUT the tension Fabric Hangar 2185 does not have secondary containment.		
5. Are your automated fire suppression systems currently fitted for AFFF or have they been retrofitted for use of high expansion foam?	☐ Currently fitted for AFFF ☐ Retrofitted for use of high expansion foam		

(Question 5 continued)	Additional information:
6. Do you have an inventory of the amount of AFFF currently stored on the installation(s) or present in the automated fire suppression systems?	Yes ☐ No ☐ Additional information:
7. Can you describe the procedure for how the suppression systems are supplied with AFFF?	
8. Have there been inadvertent releases of AFFF from hangar fire suppression systems within recent years? a) If yes, provide the time frame, and the b) estimated location of the release	Yes ☑ No ☐ Year 2015 Month February Location of release: More than 1/2 mile from shore or base boundary Additional information: Tension Fabirc Hangar 2185 has bad at least 2 AFFF releases in the past couple of years (2014,2015) but the Spill Mgr should have more details on thsese releases.
9. How are the discharges handled? (i.e. when the suppression system goes off)? Please describe.	
10. Provide a list of trucks and trailers currently carrying AFFF and where they are parked/stored? Use the "additional information" box to add more numbers or elaborate if needed.	Identify Truck/Trailer: / Location: 1. / 1. Location 2. / 2. Location 3. / 3. Location 4. / 4. Location Additional information:

11. Approximately how much AFFF (gallons) is carried/stored in the specified trucks/trailers?	Number of Gallons: 1. 2. 3. 4.
12. Are the truck(s) tested for spray patterns to make sure the equipment is working properly?	Yes ☐ No ☐ Additional information:
13. Is AFFF used during spray pattern testing or are foam distribution test kits used to eliminate AFFF waste stream?	☐ AFFF is used ☐ Foam distribution test kit is used
14. If AFFF is used during spray pattern testing, please describe the procedures used to contain and/or clean up the AFFF after release.	
15. How often are these spray tests performed?	Spray test frequency: Select one Additional information:
16. Can you provide the locations of these spray tests?	
17. Can you describe the procedure for how trucks and trailers are supplied with AFFF, and where this resupply occurs?	
18. Can you provide the procedures for how these vehicles are currently cleaned/decontaminated?	

19. When AFFF was used during a fire training exercise, how was the AFFF cleaned up and disposed of?		
20. Do you have recollection or records of AFFF being used? a) If yes, please indicate if they were used in response to the following:	Yes ☐ No ☐	
	Select one	
	Additional information:	
21. If no written records or incomplete written records are available, do you have anecdotal/verbal information and locations of spills or other emergency response incidents where AFFF was used? Please provide the approximate date, location, and a brief description of the incident(s).	1. Date Location Description	
	2. Date Location Description	
	3. Date Location Description	
	4. Date Location Description	
22. Identify all Fire-Training Areas (FTAs) which currently or historically used AFFF.	Identify FTA Location	Current/Historic?
	1. Location	1. Select one
	2. Location	2. Select one
	3. Location	3. Select one
	4. Location	4. Select one

23. For the FTAs identified above, please indicate: a) The years of operation or date range. b) The date when fire training at each FTA was last conducted.	Date Range: 1. 2. 3. 4.	Last Fire Training: 1. 2. 3. 4.
24. Do you have information on how many gallons of AFFF were released in these FTAs?	Number of Gallons 1. 2. 3. 4.	
25. What types of fuels/flammables were used at each FTA?	Fuel Type 1. 2. 3. 4.	
26. Was remedial action conducted at these FTAs? a) If "Yes", please describe the remedial action. b) Indicate the year remedial action was conducted, if known. c) Indicate whether or not a new FTA was constructed on top of the original FTA following remediation in the "Additional Information" section.	Yes ☐ Year No ☐ Additional Information:	
27. What are the current fire-fighting training practices at this installation? Please describe.		
28. What are the **non-FTA locations** where AFFF suppression systems are installed or AFFF/PFCs stored or used or disposed (i.e. hangars, fire stations, maintenance areas, wastewater treatment plants, metal plating facilities, AFFF ponds/lagoons, and/or aerospace, automotive, electronic facilities)	Identify Non-FTA Location (site/building number/description) 1. Location 2. Location 3. Location 4. Location	

29. Do these location(s) currently contain or have they historically contained AFFF/PFCs? a) If yes, please indicate the years/date range each location contained AFFF/PFCs.	Years or Date Range 1. Select one 2. Select one 3. Select one 4. Select one Additional information:
30. If applicable, when was the system at this **Non-FTA** converted from an AFFF to a high expansion foam? a) Indicate year of conversion.	Year of Conversion to High Expansion Foam 1. 2. 3. 4. Additional information:
31. Is there a metal plating/electroplating shop on base? a) If yes, please indicate the years of operation or date range.	Yes ☐ No ☐ Years of operation and additional information:
32. Is there anyone else or other base organization personnel that you would recommend we interview? If so, please list.	1. First Last 2. First Last 3. First Last 4. First Last

Thank you for your participation!

Review of the Historical Use of AFFFs and Potential Release of PFCs
NAS Patuxent River and Webster Field Annex

Introduction: The purpose of this survey is to determine the possible environmental releases or storage of AFFFs at NAS Patuxent River and Webster Field Annex, and to determine whether a follow-up interview is needed to obtain further information. The survey and interview will help us identify and document locations (i.e., sites) where PFC releases may have occurred. The information collected will be evaluated to determine if the site warrants further investigation, including soil or groundwater sampling.

This form is voluntary and any information you provide will be used strictly to evaluate the need for further site investigation. Please respond to all questions you are able to answer, in part or in whole. Please leave cells blank if an answer cannot be provided.

Your time and expertise are greatly appreciated.

Date/Time of Interview: Select date Select time	**Work Location (Installation/Building/Area):** NAS Patuxent River Building #/Area504		
Interviewee Name:	**Position/Job Title:** Clean Water Program Manager		
How many years at current position: 10	**Phone/Email:**		
1. What types of firefighting foams are currently used at the installation?	3% AFFF Select an installation	6% AFFF Select an installation	High Expansion Foam Select an installation
	Other; please list:		
2. What manufacturer's AFFF products are currently used at the installation?	3M ☐	Ansul ☐	Chemguard ☐
	Other; please list:		
3. Where are the AFFF solutions currently stored, transferred, or handled at the installation? Please describe.			
4. Is there a secondary containment in the AFFF storage area(s)?	Yes ☐ No ☐		
	Additional information:		
5. Are your automated fire suppression systems currently fitted for AFFF or have they been retrofitted for use of high expansion foam?	☐ Currently fitted for AFFF ☐ Retrofitted for use of high expansion foam		

(Question 5 continued)	Additional information:
6. Do you have an inventory of the amount of AFFF currently stored on the installation(s) or present in the automated fire suppression systems?	Yes ☐ No ☐ Additional information:
7. Can you describe the procedure for how the suppression systems are supplied with AFFF?	
8. Have there been inadvertent releases of AFFF from hangar fire suppression systems within recent years? a) If yes, provide the time frame, and the b) estimated location of the release	Yes ☑ No ☐ Year Month Select a month Location of release: Select location Additional information: The following are AFFF release events that I have investigated. 11/2002: Hangar 2133 06/2005: Hangar 2133 04/2010: Hangar 2133 05/2011: Hangar 2905
9. How are the discharges handled? (i.e. when the suppression system goes off)? Please describe.	Depends on location. Some areas have automated actuator valves that divert flow into a containment tank, while at least one hangar needs to manually diverted by inserting a T-Bar into a valve box outside the hangar doors (2133). Temporary/tension fabric hangars have zero containment and collection areas.
10. Provide a list of trucks and trailers currently carrying AFFF and where they are parked/stored? Use the "additional information" box to add more numbers or elaborate if needed.	Identify Truck/Trailer: / Location: 1. / 1. Location 2. / 2. Location 3. / 3. Location 4. / 4. Location Additional information:

11. Approximately how much AFFF (gallons) is carried/stored in the specified trucks/trailers?	Number of Gallons: 1. 2. 3. 4.
12. Are the truck(s) tested for spray patterns to make sure the equipment is working properly?	Yes ☐ No ☐ Additional information:
13. Is AFFF used during spray pattern testing or are foam distribution test kits used to eliminate AFFF waste stream?	☐ AFFF is used ☐ Foam distribution test kit is used
14. If AFFF is used during spray pattern testing, please describe the procedures used to contain and/or clean up the AFFF after release.	
15. How often are these spray tests performed?	Spray test frequency: Select one Additional information:
16. Can you provide the locations of these spray tests?	
17. Can you describe the procedure for how trucks and trailers are supplied with AFFF, and where this resupply occurs?	
18. Can you provide the procedures for how these vehicles are currently cleaned/decontaminated?	

19. When AFFF was used during a fire training exercise, how was the AFFF cleaned up and disposed of?		
20. Do you have recollection or records of AFFF being used? a) If yes, please indicate if they were used in response to the following:	Yes ☐ No ☐	
	Select one	
	Additional information:	
21. If no written records or incomplete written records are available, do you have anecdotal/verbal information and locations of spills or other emergency response incidents where AFFF was used? Please provide the approximate date, location, and a brief description of the incident(s).	1. Date Location Description	
	2. Date Location Description	
	3. Date Location Description	
	4. Date Location Description	
22. Identify all Fire-Training Areas (FTAs) which currently or historically used AFFF.	Identify FTA Location	Current/Historic?
	1. Location	1. Select one
	2. Location	2. Select one
	3. Location	3. Select one
	4. Location	4. Select one

23. For the FTAs identified above, please indicate: a) The years of operation or date range. b) The date when fire training at each FTA was last conducted.	Date Range: 1. 2. 3. 4.	Last Fire Training: 1. 2. 3. 4.
24. Do you have information on how many gallons of AFFF were released in these FTAs?	Number of Gallons 1. 2. 3. 4.	
25. What types of fuels/flammables were used at each FTA?	Fuel Type 1. 2. 3. 4.	
26. Was remedial action conducted at these FTAs? a) If "Yes", please describe the remedial action. b) Indicate the year remedial action was conducted, if known. c) Indicate whether or not a new FTA was constructed on top of the original FTA following remediation in the "Additional Information" section.	Yes ☐ Year No ☐ Additional Information:	
27. What are the current fire-fighting training practices at this installation? Please describe.		
28. What are the **non-FTA locations** where AFFF suppression systems are installed or AFFF/PFCs stored or used or disposed (i.e. hangars, fire stations, maintenance areas, wastewater treatment plants, metal plating facilities, AFFF ponds/lagoons, and/or aerospace, automotive, electronic facilities)	Identify Non-FTA Location (site/building number/description) 1. Location 2. Location 3. Location 4. Location	

29. Do these location(s) currently contain or have they historically contained AFFF/PFCs? a) If yes, please indicate the years/date range each location contained AFFF/PFCs.	Years or Date Range 1. Select one 2. Select one 3. Select one 4. Select one Additional information:
30. If applicable, when was the system at this **Non-FTA** converted from an AFFF to a high expansion foam? a) Indicate year of conversion.	Year of Conversion to High Expansion Foam 1. 2. 3. 4. Additional information:
31. Is there a metal plating/electroplating shop on base? a) If yes, please indicate the years of operation or date range.	Yes ☑ No ☐ Years of operation and additional information:
32. Is there anyone else or other base organization personnel that you would recommend we interview? If so, please list.	1. First Last 2. First Last 3. First Last 4. First Last

Thank you for your participation!

Review of the Historical Use of AFFFs and Potential Release of PFCs
NAS Patuxent River and Webster Field Annex

Introduction: The purpose of this survey is to determine the possible environmental releases or storage of AFFFs at NAS Patuxent River and Webster Field Annex, and to determine whether a follow-up interview is needed to obtain further information. The survey and interview will help us identify and document locations (i.e., sites) where PFC releases may have occurred. The information collected will be evaluated to determine if the site warrants further investigation, including soil or groundwater sampling.

This form is voluntary and any information you provide will be used strictly to evaluate the need for further site investigation. Please respond to all questions you are able to answer, in part or in whole. Please leave cells blank if an answer cannot be provided.

Your time and expertise are greatly appreciated.

Date/Time of Interview: Wednesday, Sept. 28 09:00	**Work Location (Installation/Building/Area):** NAS Patuxent River Building #/Area		
Interviewee Name: Mr.	**Position/Job Title:** Plumbing/Mechanical Engineering Tech		
How many years at current position: 29 years	**Phone/Email:**		
1. What types of firefighting foams are currently used at the installation?	3% AFFF NAS Patuxent River	6% AFFF NAS Patuxent River	High Expansion Foam NAS Patuxent River
	Other; please list:		
2. What manufacturer's AFFF products are currently used at the installation?	3M ☑	Ansul ☐	Chemguard ☑
	Other; please list:		
3. Where are the AFFF solutions currently stored, transferred, or handled at the installation? Please describe.			
4. Is there a secondary containment in the AFFF storage area(s)?	Yes ☐	No ☐	
	Additional information:		
5. Are your automated fire suppression systems currently fitted for AFFF or have they been retrofitted for use of high expansion foam?	☐ Currently fitted for AFFF ☐ Retrofitted for use of high expansion foam		

(Question 5 continued)	Additional information:
6. Do you have an inventory of the amount of AFFF currently stored on the installation(s) or present in the automated fire suppression systems?	Yes ☐ No ☐ Additional information:
7. Can you describe the procedure for how the suppression systems are supplied with AFFF?	
8. Have there been inadvertent releases of AFFF from hangar fire suppression systems within recent years? a) If yes, provide the time frame, and the b) estimated location of the release	Yes ☐ No ☐ Year Month Select a month Location of release: Select location Additional information:
9. How are the discharges handled? (i.e. when the suppression system goes off)? Please describe.	
10. Provide a list of trucks and trailers currently carrying AFFF and where they are parked/stored? Use the "additional information" box to add more numbers or elaborate if needed.	Identify Truck/Trailer: / Location: 1. / 1. Location 2. / 2. Location 3. / 3. Location 4. / 4. Location Additional information:

11. Approximately how much AFFF (gallons) is carried/stored in the specified trucks/trailers?	Number of Gallons: 1. 2. 3. 4.
12. Are the truck(s) tested for spray patterns to make sure the equipment is working properly?	Yes ☐ No ☐ Additional information:
13. Is AFFF used during spray pattern testing or are foam distribution test kits used to eliminate AFFF waste stream?	☐ AFFF is used ☐ Foam distribution test kit is used
14. If AFFF is used during spray pattern testing, please describe the procedures used to contain and/or clean up the AFFF after release.	
15. How often are these spray tests performed?	Spray test frequency: Select one Additional information:
16. Can you provide the locations of these spray tests?	
17. Can you describe the procedure for how trucks and trailers are supplied with AFFF, and where this resupply occurs?	
18. Can you provide the procedures for how these vehicles are currently cleaned/decontaminated?	

19. When AFFF was used during a fire training exercise, how was the AFFF cleaned up and disposed of?		
20. Do you have recollection or records of AFFF being used? a) If yes, please indicate if they were used in response to the following:	Yes ☐ No ☐	
	Select one	
	Additional information:	
21. If no written records or incomplete written records are available, do you have anecdotal/verbal information and locations of spills or other emergency response incidents where AFFF was used? Please provide the approximate date, location, and a brief description of the incident(s).	1. Date Location Description	
	2. Date Location Description	
	3. Date Location Description	
	4. Date Location Description	
22. Identify all Fire-Training Areas (FTAs) which currently or historically used AFFF.	Identify FTA Location	Current/Historic?
	1. Location	1. Select one
	2. Location	2. Select one
	3. Location	3. Select one
	4. Location	4. Select one

23. For the FTAs identified above, please indicate: a) The years of operation or date range. b) The date when fire training at each FTA was last conducted.	Date Range: 1. 2. 3. 4.	Last Fire Training: 1. 2. 3. 4.
24. Do you have information on how many gallons of AFFF were released in these FTAs?	Number of Gallons 1. 2. 3. 4.	
25. What types of fuels/flammables were used at each FTA?	Fuel Type 1. 2. 3. 4.	
26. Was remedial action conducted at these FTAs? a) If "Yes", please describe the remedial action. b) Indicate the year remedial action was conducted, if known. c) Indicate whether or not a new FTA was constructed on top of the original FTA following remediation in the "Additional Information" section.	Yes ☐ Year No ☐ Additional Information:	
27. What are the current fire-fighting training practices at this installation? Please describe.		
28. What are the **non-FTA locations** where AFFF suppression systems are installed or AFFF/PFCs stored or used or disposed (i.e. hangars, fire stations, maintenance areas, wastewater treatment plants, metal plating facilities, AFFF ponds/lagoons, and/or aerospace, automotive, electronic facilities)	Identify Non-FTA Location (site/building number/description) 1. Location 2. Location 3. Location 4. Location	

29. Do these location(s) currently contain or have they historically contained AFFF/PFCs? a) If yes, please indicate the years/date range each location contained AFFF/PFCs.	Years or Date Range 1. Select one 2. Select one 3. Select one 4. Select one Additional information:
30. If applicable, when was the system at this **Non-FTA** converted from an AFFF to a high expansion foam? a) Indicate year of conversion.	Year of Conversion to High Expansion Foam 1. 2. 3. 4. Additional information:
31. Is there a metal plating/electroplating shop on base? a) If yes, please indicate the years of operation or date range.	Yes ☐ No ☐ Years of operation and additional information:
32. Is there anyone else or other base organization personnel that you would recommend we interview? If so, please list.	1. First Last 2. First Last 3. First Last 4. First Last

Thank you for your participation!

Review of the Historical Use of AFFFs and Potential Release of PFCs
NAS Patuxent River and Webster Field Annex

Introduction: The purpose of this survey is to determine the possible environmental releases or storage of AFFFs at NAS Patuxent River and Webster Field Annex, and to determine whether a follow-up interview is needed to obtain further information. The survey and interview will help us identify and document locations (i.e., sites) where PFC releases may have occurred. The information collected will be evaluated to determine if the site warrants further investigation, including soil or groundwater sampling.

This form is voluntary and any information you provide will be used strictly to evaluate the need for further site investigation. Please respond to all questions you are able to answer, in part or in whole. Please leave cells blank if an answer cannot be provided.

Your time and expertise are greatly appreciated.

Date/Time of Interview: Select date Select time	**Work Location (Installation/Building/Area):** NAS Patuxent River Building #/Area B-504		
Interviewee Name:	**Position/Job Title:** Cuoltural Resource Manager		
How many years at current position: 6	**Phone/Email:**		
1. What types of firefighting foams are currently used at the installation?	3% AFFF Select an installation	6% AFFF Select an installation	High Expansion Foam Select an installation
	Other; please list:		
2. What manufacturer's AFFF products are currently used at the installation?	3M ☐	Ansul ☐	Chemguard ☐
	Other; please list:		
3. Where are the AFFF solutions currently stored, transferred, or handled at the installation? Please describe.			
4. Is there a secondary containment in the AFFF storage area(s)?	Yes ☐	No ☐	
	Additional information:		
5. Are your automated fire suppression systems currently fitted for AFFF or have they been retrofitted for use of high expansion foam?	☐ Currently fitted for AFFF ☐ Retrofitted for use of high expansion foam		

(Question 5 continued)	Additional information:
6. Do you have an inventory of the amount of AFFF currently stored on the installation(s) or present in the automated fire suppression systems?	Yes ☐ No ☐ Additional information:
7. Can you describe the procedure for how the suppression systems are supplied with AFFF?	
8. Have there been inadvertent releases of AFFF from hangar fire suppression systems within recent years? a) If yes, provide the time frame, and the b) estimated location of the release	Yes ☐ No ☐ Year Month Select a month Location of release: Select location Additional information:
9. How are the discharges handled? (i.e. when the suppression system goes off)? Please describe.	
10. Provide a list of trucks and trailers currently carrying AFFF and where they are parked/stored? Use the "additional information" box to add more numbers or elaborate if needed.	Identify Truck/Trailer: / Location: 1. / 1. Location 2. / 2. Location 3. / 3. Location 4. / 4. Location Additional information:

11. Approximately how much AFFF (gallons) is carried/stored in the specified trucks/trailers?	Number of Gallons: 1. 2. 3. 4.
12. Are the truck(s) tested for spray patterns to make sure the equipment is working properly?	Yes ☐ No ☐ Additional information:
13. Is AFFF used during spray pattern testing or are foam distribution test kits used to eliminate AFFF waste stream?	☐ AFFF is used ☐ Foam distribution test kit is used
14. If AFFF is used during spray pattern testing, please describe the procedures used to contain and/or clean up the AFFF after release.	
15. How often are these spray tests performed?	Spray test frequency: Select one Additional information:
16. Can you provide the locations of these spray tests?	
17. Can you describe the procedure for how trucks and trailers are supplied with AFFF, and where this resupply occurs?	
18. Can you provide the procedures for how these vehicles are currently cleaned/decontaminated?	

19. When AFFF was used during a fire training exercise, how was the AFFF cleaned up and disposed of?	
20. Do you have recollection or records of AFFF being used? a) If yes, please indicate if they were used in response to the following:	Yes ☐ No ☐
	Select one
	Additional information:
21. If no written records or incomplete written records are available, do you have anecdotal/verbal information and locations of spills or other emergency response incidents where AFFF was used? Please provide the approximate date, location, and a brief description of the incident(s).	1. Date Location B-102 Description : I have seen an old photo of a shipping cantainer-type building being foamed at B-102 appartently as a training exercise. B-102 used to be Firehouse # 1, built in 1942 and it used as a firehouse at least until the mid
	2. Date Location Description
	3. Date Location Description
	4. Date Location Description

22. Identify all Fire-Training Areas (FTAs) which currently or historically used AFFF.	Identify FTA Location	Current/Historic?
	1. Location B-102	1. Historic
	2. Location	2. Select one
	3. Location	3. Select one
	4. Location	4. Select one

23. For the FTAs identified above, please indicate: a) The years of operation or date range. b) The date when fire training at each FTA was last conducted.	Date Range: 1. unknown 2. 3. 4.	Last Fire Training: 1. 2. 3. 4.
24. Do you have information on how many gallons of AFFF were released in these FTAs?	Number of Gallons 1. no information 2. 3. 4.	
25. What types of fuels/flammables were used at each FTA?	Fuel Type 1. 2. 3. 4.	
26. Was remedial action conducted at these FTAs? a) If "Yes", please describe the remedial action. b) Indicate the year remedial action was conducted, if known. c) Indicate whether or not a new FTA was constructed on top of the original FTA following remediation in the "Additional Information" section.	Yes ☐ Year No ☐ Additional Information:	
27. What are the current fire-fighting training practices at this installation? Please describe.		
28. What are the **non-FTA locations** where AFFF suppression systems are installed or AFFF/PFCs stored or used or disposed (i.e. hangars, fire stations, maintenance areas, wastewater treatment plants, metal plating facilities, AFFF ponds/lagoons, and/or aerospace, automotive, electronic facilities)	Identify Non-FTA Location (site/building number/description) 1. Location 2. Location 3. Location 4. Location	

29. Do these location(s) currently contain or have they historically contained AFFF/PFCs? a) If yes, please indicate the years/date range each location contained AFFF/PFCs.	Years or Date Range 1. Select one 2. Select one 3. Select one 4. Select one Additional information:
30. If applicable, when was the system at this **Non-FTA** converted from an AFFF to a high expansion foam? a) Indicate year of conversion.	Year of Conversion to High Expansion Foam 1. 2. 3. 4. Additional information:
31. Is there a metal plating/electroplating shop on base? a) If yes, please indicate the years of operation or date range.	Yes ☑ No ☐ Years of operation and additional information: unknown Building 114 : Listed in INFADS as being a plating shop in 1963. Nearby B-116 was listed as pint and oil storage (1942) & Hazardous & Flammable storage 1971. Might be related to IR sites 24 & 55
32. Is there anyone else or other base organization personnel that you would recommend we interview? If so, please list.	1. First Last 2. First Last 3. First Last 4. First Last

Thank you for your participation!

Review of the Historical Use of AFFFs and Potential Release of PFCs
NAS Patuxent River and Webster Field Annex

Introduction: The purpose of this survey is to determine the possible environmental releases or storage of AFFFs at NAS Patuxent River and Webster Field Annex, and to determine whether a follow-up interview is needed to obtain further information. The survey and interview will help us identify and document locations (i.e., sites) where PFC releases may have occurred. The information collected will be evaluated to determine if the site warrants further investigation, including soil or groundwater sampling.

This form is voluntary and any information you provide will be used strictly to evaluate the need for further site investigation. Please respond to all questions you are able to answer, in part or in whole. Please leave cells blank if an answer cannot be provided.

Your time and expertise are greatly appreciated.

Date/Time of Interview: Monday, Sept. 26 09:00	**Work Location (Installation/Building/Area):** NAS Patuxent River Building # 504 Second Floor Environmen
Interviewee Name:	**Position/Job Title:** Natural Resources Specialist
How many years at current position: 19	**Phone/Email:**
1. What types of firefighting foams are currently used at the installation?	3% AFFF: Select an installation; 6% AFFF: Select an installation; High Expansion Foam: Select an installation Other; please list: Unknown
2. What manufacturer's AFFF products are currently used at the installation?	3M ☐ Ansul ☐ Chemguard ☐ Other; please list: Unknown
3. Where are the AFFF solutions currently stored, transferred, or handled at the installation? Please describe.	Unknown
4. Is there a secondary containment in the AFFF storage area(s)?	Yes ☐ No ☐ Additional information: Unknown
5. Are your automated fire suppression systems currently fitted for AFFF or have they been retrofitted for use of high expansion foam?	☐ Currently fitted for AFFF ☐ Retrofitted for use of high expansion foam

(Question 5 continued)	Additional information: Unknown
6. Do you have an inventory of the amount of AFFF currently stored on the installation(s) or present in the automated fire suppression systems?	Yes ☐ No ☑ Additional information:
7. Can you describe the procedure for how the suppression systems are supplied with AFFF?	No.
8. Have there been inadvertent releases of AFFF from hangar fire suppression systems within recent years? a) If yes, provide the time frame, and the b) estimated location of the release	Yes ☑ No ☐ Year Ukn Month Select a month Location of release: Select location Additional information: No specifics known. Only aware of release from communication with co-workers.
9. How are the discharges handled? (i.e. when the suppression system goes off)? Please describe.	Unknown
10. Provide a list of trucks and trailers currently carrying AFFF and where they are parked/stored? Use the "additional information" box to add more numbers or elaborate if needed.	Identify Truck/Trailer: / Location: 1. / 1. Location 2. / 2. Location 3. / 3. Location 4. / 4. Location Additional information: Unknown

11. Approximately how much AFFF (gallons) is carried/stored in the specified trucks/trailers?	Number of Gallons: 1. Unknown 2. 3. 4.
12. Are the truck(s) tested for spray patterns to make sure the equipment is working properly?	Yes ☐ No ☐ Additional information: Unknown
13. Is AFFF used during spray pattern testing or are foam distribution test kits used to eliminate AFFF waste stream?	☐ AFFF is used ☐ Foam distribution test kit is used
14. If AFFF is used during spray pattern testing, please describe the procedures used to contain and/or clean up the AFFF after release.	
15. How often are these spray tests performed?	Spray test frequency: Select one Additional information: Unknown
16. Can you provide the locations of these spray tests?	No.
17. Can you describe the procedure for how trucks and trailers are supplied with AFFF, and where this resupply occurs?	No.
18. Can you provide the procedures for how these vehicles are currently cleaned/decontaminated?	No.

19. When AFFF was used during a fire training exercise, how was the AFFF cleaned up and disposed of?	Unknown	
20. Do you have recollection or records of AFFF being used? a) If yes, please indicate if they were used in response to the following:	Yes ☐ No ☑	
	Select one	
	Additional information:	
21. If no written records or incomplete written records are available, do you have anecdotal/verbal information and locations of spills or other emergency response incidents where AFFF was used? Please provide the approximate date, location, and a brief description of the incident(s).	1. Date Location Description	
	2. Date Location Description	
	3. Date Location Description	
	4. Date Location Description	
22. Identify all Fire-Training Areas (FTAs) which currently or historically used AFFF.	Identify FTA Location	Current/Historic?
	1. Location	1. Select one
	2. Location	2. Select one
	3. Location	3. Select one
	4. Location	4. Select one

23. For the FTAs identified above, please indicate: a) The years of operation or date range. b) The date when fire training at each FTA was last conducted.	Date Range: 1. 2. 3. 4.	Last Fire Training: 1. 2. 3. 4.
24. Do you have information on how many gallons of AFFF were released in these FTAs?	Number of Gallons 1. Unknown 2. 3. 4.	
25. What types of fuels/flammables were used at each FTA?	Fuel Type 1. Unknown 2. 3. 4.	
26. Was remedial action conducted at these FTAs? a) If "Yes", please describe the remedial action. b) Indicate the year remedial action was conducted, if known. c) Indicate whether or not a new FTA was constructed on top of the original FTA following remediation in the "Additional Information" section.	Yes ☐ Year No ☐ Additional Information: Unknown	
27. What are the current fire-fighting training practices at this installation? Please describe.	Unknown	
28. What are the **non-FTA locations** where AFFF suppression systems are installed or AFFF/PFCs stored or used or disposed (i.e. hangars, fire stations, maintenance areas, wastewater treatment plants, metal plating facilities, AFFF ponds/lagoons, and/or aerospace, automotive, electronic facilities)	Identify Non-FTA Location (site/building number/description) 1. Unknown 2. Location 3. Location 4. Location	

29. Do these location(s) currently contain or have they historically contained AFFF/PFCs? a) If yes, please indicate the years/date range each location contained AFFF/PFCs.	Years or Date Range 1. Select one unknown 2. Select one 3. Select one 4. Select one Additional information:
30. If applicable, when was the system at this **Non-FTA** converted from an AFFF to a high expansion foam? a) Indicate year of conversion.	Year of Conversion to High Expansion Foam 1. 2. 3. 4. Additional information: Unknown
31. Is there a metal plating/electroplating shop on base? a) If yes, please indicate the years of operation or date range.	Yes ☐ No ☐ Years of operation and additional information: Unknown
32. Is there anyone else or other base organization personnel that you would recommend we interview? If so, please list.	1. First Last 2. First Last 3. First Last 4. First Last

Thank you for your participation!

Review of the Historical Use of AFFFs and Potential Release of PFCs
NAS Patuxent River and Webster Field Annex

Introduction: The purpose of this survey is to determine the possible environmental releases or storage of AFFFs at NAS Patuxent River and Webster Field Annex, and to determine whether a follow-up interview is needed to obtain further information. The survey and interview will help us identify and document locations (i.e., sites) where PFC releases may have occurred. The information collected will be evaluated to determine if the site warrants further investigation, including soil or groundwater sampling.

This form is voluntary and any information you provide will be used strictly to evaluate the need for further site investigation. Please respond to all questions you are able to answer, in part or in whole. Please leave cells blank if an answer cannot be provided.

Your time and expertise are greatly appreciated.

Date/Time of Interview: Select date Select time	**Work Location (Installation/Building/Area):** Select installation Building #/Area		
Interviewee Name: Mr.	**Position/Job Title:** District Fire Chief		
How many years at current position: 2	**Phone/Email:**		
1. What types of firefighting foams are currently used at the installation?	3% AFFF NAS Patuxent River	6% AFFF Select an installation	High Expansion Foam Select an installation
	Other; please list:		
2. What manufacturer's AFFF products are currently used at the installation?	3M ☑	Ansul ☐	Chemguard ☐
	Other; please list:		
3. Where are the AFFF solutions currently stored, transferred, or handled at the installation? Please describe.	3M Light Water AFFF 3% Mil Spec F-24385F		
4. Is there a secondary containment in the AFFF storage area(s)?	Yes ☐	No ☑	
	Additional information:		
5. Are your automated fire suppression systems currently fitted for AFFF or have they been retrofitted for use of high expansion foam?	☐ Currently fitted for AFFF ☐ Retrofitted for use of high expansion foam		

(Question 5 continued)	Additional information:
6. Do you have an inventory of the amount of AFFF currently stored on the installation(s) or present in the automated fire suppression systems?	Yes ☑ No ☐ Additional information:
7. Can you describe the procedure for how the suppression systems are supplied with AFFF?	
8. Have there been inadvertent releases of AFFF from hangar fire suppression systems within recent years? a) If yes, provide the time frame, and the b) estimated location of the release	Yes ☐ No ☐ Year Month Select a month Location of release: Select location Additional information:
9. How are the discharges handled? (i.e. when the suppression system goes off)? Please describe.	
10. Provide a list of trucks and trailers currently carrying AFFF and where they are parked/stored? Use the "additional information" box to add more numbers or elaborate if needed.	Identify Truck/Trailer: 1. Foam 135 2. Foam 136 3. Foam 137 4. Foam 138 Location: 1. Fire Station 1 bldg 103 2. Fire Station 1 bldg 103 3. Location bldg 103 4. Location bldg 103 Additional information: Engine 134 Fire Station 1 Bldg 103 (50gallons) UTV-13 Fire Station 1 Bldg 103 (9 gallons) Reserve Foam Unit Fire Station 1 Bldg 103 (210 gallons) Engine 132 Fire Station 2 Bldg 443 (42 gallons) Brush 13 Fire Station 2 Bldg 443 (30 gallons)

11. Approximately how much AFFF (gallons) is carried/stored in the specified trucks/trailers?	Number of Gallons: 1. 200 2. 400 3. 420 4. 420
12. Are the truck(s) tested for spray patterns to make sure the equipment is working properly?	Yes ☑ No ☐ Additional information: Water Only
13. Is AFFF used during spray pattern testing or are foam distribution test kits used to eliminate AFFF waste stream?	☐ AFFF is used ☐ Foam distribution test kit is used
14. If AFFF is used during spray pattern testing, please describe the procedures used to contain and/or clean up the AFFF after release.	N/A
15. How often are these spray tests performed?	Spray test frequency: Daily Additional information:
16. Can you provide the locations of these spray tests?	Alpha taxiway wash rack Accross from Crash Bays on the closed taxiway.
17. Can you describe the procedure for how trucks and trailers are supplied with AFFF, and where this resupply occurs?	5 gallon buckets
18. Can you provide the procedures for how these vehicles are currently cleaned/decontaminated?	soap and water

19. When AFFF was used during a fire training exercise, how was the AFFF cleaned up and disposed of?	Not used.	
20. Do you have recollection or records of AFFF being used? a) If yes, please indicate if they were used in response to the following:	Yes ☑ No ☐	
	Emergency response sites (i.e. crash sites and other fires)	
	Additional information:	
21. If no written records or incomplete written records are available, do you have anecdotal/verbal information and locations of spills or other emergency response incidents where AFFF was used? Please provide the approximate date, location, and a brief description of the incident(s).	1. Date July 2000 NAS Pax Skeet Range Description T-38 Crash with fire	
	2. Date 2011 Charles County Rt 6 Burches Garage Junk/Auto Salvage yard fire	
	3. 2010 Commerce Dr. Hollywood MD Auto Salvage yard Fire.	
	4. Date Location Description	
22. Identify all Fire-Training Areas (FTAs) which currently or historically used AFFF.	Identify FTA Location	Current/Historic?
	1. N/A	1. Select one
	2. Location	2. Select one
	3. Location	3. Select one
	4. Location	4. Select one

23. For the FTAs identified above, please indicate: a) The years of operation or date range. b) The date when fire training at each FTA was last conducted.	Date Range:	Last Fire Training:
	1. N/A 2. 3. 4.	1. 2. 3. 4.
24. Do you have information on how many gallons of AFFF were released in these FTAs?	Number of Gallons	
	1. N/A 2. 3. 4.	
25. What types of fuels/flammables were used at each FTA?	Fuel Type	
	1. N/A 2. 3. 4.	
26. Was remedial action conducted at these FTAs? a) If "Yes", please describe the remedial action. b) Indicate the year remedial action was conducted, if known. c) Indicate whether or not a new FTA was constructed on top of the original FTA following remediation in the "Additional Information" section.	Yes ☐ Year No ☐	
	Additional Information:	
27. What are the current fire-fighting training practices at this installation? Please describe.	We do not conduct AFFF training.	
28. What are the **non-FTA locations** where AFFF suppression systems are installed or AFFF/PFCs stored or used or disposed (i.e. hangars, fire stations, maintenance areas, wastewater treatment plants, metal plating facilities, AFFF ponds/lagoons, and/or aerospace, automotive, electronic facilities)	Identify Non-FTA Location (site/building number/description)	
	1. Fire Station 1 Bldg 103 (550 gallons) 2. Fire Station 2 Bldg 443 (5 gallons) 3. Bldg 2385 HAZMAT Storage (1570 gallons) 4. Location	

29. Do these location(s) currently contain or have they historically contained AFFF/PFCs? a) If yes, please indicate the years/date range each location contained AFFF/PFCs.	Years or Date Range 1. Yes 2. Yes 3. Yes 4. Select one Additional information:
30. If applicable, when was the system at this **Non-FTA** converted from an AFFF to a high expansion foam? a) Indicate year of conversion.	Year of Conversion to High Expansion Foam 1. 2. 3. 4. Additional information:
31. Is there a metal plating/electroplating shop on base? a) If yes, please indicate the years of operation or date range.	Yes ☐ No ☐ Years of operation and additional information:
32. Is there anyone else or other base organization personnel that you would recommend we interview? If so, please list.	1. First Last 2. First Last 3. First Last 4. First Last

Thank you for your participation!

Review of the Historical Use of AFFFs and Potential Release of PFCs
NAS Patuxent River and Webster Field Annex

Introduction: The purpose of this survey is to determine the possible environmental releases or storage of AFFFs at NAS Patuxent River and Webster Field Annex, and to determine whether a follow-up interview is needed to obtain further information. The survey and interview will help us identify and document locations (i.e., sites) where PFC releases may have occurred. The information collected will be evaluated to determine if the site warrants further investigation, including soil or groundwater sampling.

This form is voluntary and any information you provide will be used strictly to evaluate the need for further site investigation. Please respond to all questions you are able to answer, in part or in whole. Please leave cells blank if an answer cannot be provided.

Your time and expertise are greatly appreciated.

Date/Time of Interview: Select date Select time	**Work Location (Installation/Building/Area):** Webster Field Annex 8076		
Interviewee Name: Mr.	**Position/Job Title:** District Fire Chief		
How many years at current position: 2	**Phone/Email:**		
1. What types of firefighting foams are currently used at the installation?	3% AFFF Webster Field Annex	6% AFFF Select an installation	High Expansion Foam Select an installation
	Other; please list:		
2. What manufacturer's AFFF products are currently used at the installation?	3M ☑	Ansul ☐	Chemguard ☐
	Other; please list:		
3. Where are the AFFF solutions currently stored, transferred, or handled at the installation? Please describe.	3M Light Water AFFF 3% Mil Spec F-24385F		
4. Is there a secondary containment in the AFFF storage area(s)?	Yes ☐	No ☑	
	Additional information:		
5. Are your automated fire suppression systems currently fitted for AFFF or have they been retrofitted for use of high expansion foam?	☐ Currently fitted for AFFF ☐ Retrofitted for use of high expansion foam		

(Question 5 continued)	Additional information:	
6. Do you have an inventory of the amount of AFFF currently stored on the installation(s) or present in the automated fire suppression systems?	Yes ☑ No ☐	
	Additional information:	
7. Can you describe the procedure for how the suppression systems are supplied with AFFF?		
8. Have there been inadvertent releases of AFFF from hangar fire suppression systems within recent years? a) If yes, provide the time frame, and the b) estimated location of the release	Yes ☐ No ☐	
	Year Month Select a month	
	Location of release: Select location	
	Additional information:	
9. How are the discharges handled? (i.e. when the suppression system goes off)? Please describe.		
10. Provide a list of trucks and trailers currently carrying AFFF and where they are parked/stored? Use the "additional information" box to add more numbers or elaborate if needed.	Identify Truck/Trailer:	Location:
	1. Foam 143 2. Foam 144 3. Engine 141 4.	1. Fire Station 3 bldg 8076 2. Fire Station 3 bldg 8076 3. Fire Station 3 bldg 8076 4.
	Additional information:	

11. Approximately how much AFFF (gallons) is carried/stored in the specified trucks/trailers?	Number of Gallons: 1. 50 2. 210 3. 50 4.
12. Are the truck(s) tested for spray patterns to make sure the equipment is working properly?	Yes ☑ No ☐ Additional information: Water Only
13. Is AFFF used during spray pattern testing or are foam distribution test kits used to eliminate AFFF waste stream?	☐ AFFF is used ☐ Foam distribution test kit is used
14. If AFFF is used during spray pattern testing, please describe the procedures used to contain and/or clean up the AFFF after release.	N/A
15. How often are these spray tests performed?	Spray test frequency: Daily Additional information:
16. Can you provide the locations of these spray tests?	Front of fire station.
17. Can you describe the procedure for how trucks and trailers are supplied with AFFF, and where this resupply occurs?	5 gallon buckets
18. Can you provide the procedures for how these vehicles are currently cleaned/decontaminated?	soap and water

19. When AFFF was used during a fire training exercise, how was the AFFF cleaned up and disposed of?	Not used.	
20. Do you have recollection or records of AFFF being used? a) If yes, please indicate if they were used in response to the following:	Yes ☑ No ☐	
	Emergency response sites (i.e. crash sites and other fires)	
	Additional information:	
21. If no written records or incomplete written records are available, do you have anecdotal/verbal information and locations of spills or other emergency response incidents where AFFF was used? Please provide the approximate date, location, and a brief description of the incident(s).	1.	
	2.	
	3.	
	4. Date Location Description	
22. Identify all Fire-Training Areas (FTAs) which currently or historically used AFFF.	Identify FTA Location	Current/Historic?
	1. N/A	1. Select one
	2. Location	2. Select one
	3. Location	3. Select one
	4. Location	4. Select one

23. For the FTAs identified above, please indicate: a) The years of operation or date range. b) The date when fire training at each FTA was last conducted.	Date Range:	Last Fire Training:
	1. N/A 2. 3. 4.	1. 2. 3. 4.
24. Do you have information on how many gallons of AFFF were released in these FTAs?	Number of Gallons	
	1. N/A 2. 3. 4.	
25. What types of fuels/flammables were used at each FTA?	Fuel Type	
	1. N/A 2. 3. 4.	
26. Was remedial action conducted at these FTAs? a) If "Yes", please describe the remedial action. b) Indicate the year remedial action was conducted, if known. c) Indicate whether or not a new FTA was constructed on top of the original FTA following remediation in the "Additional Information" section.	Yes ☐ Year No ☐	
	Additional Information:	
27. What are the current fire-fighting training practices at this installation? Please describe.	We do not conduct AFFF training.	
28. What are the **non-FTA locations** where AFFF suppression systems are installed or AFFF/PFCs stored or used or disposed (i.e. hangars, fire stations, maintenance areas, wastewater treatment plants, metal plating facilities, AFFF ponds/lagoons, and/or aerospace, automotive, electronic facilities)	Identify Non-FTA Location (site/building number/description)	
	1. Fire Station 3 Bldg 8076 (245 gallons) 2. 3. 4.	

29. Do these location(s) currently contain or have they historically contained AFFF/PFCs? a) If yes, please indicate the years/date range each location contained AFFF/PFCs.	Years or Date Range 1. Yes 2. Select one 3. Select one 4. Select one Additional information:
30. If applicable, when was the system at this **Non-FTA** converted from an AFFF to a high expansion foam? a) Indicate year of conversion.	Year of Conversion to High Expansion Foam 1. 2. 3. 4. Additional information:
31. Is there a metal plating/electroplating shop on base? a) If yes, please indicate the years of operation or date range.	Yes ☐ No ☐ Years of operation and additional information:
32. Is there anyone else or other base organization personnel that you would recommend we interview? If so, please list.	1. First Last 2. First Last 3. First Last 4. First Last

Thank you for your participation!

Review of the Historical Use of AFFFs and Potential Release of PFCs
NAS Patuxent River and Webster Field Annex

Introduction: The purpose of this survey is to determine the possible environmental releases or storage of AFFFs at NAS Patuxent River and Webster Field Annex, and to determine whether a follow-up interview is needed to obtain further information. The survey and interview will help us identify and document locations (i.e., sites) where PFC releases may have occurred. The information collected will be evaluated to determine if the site warrants further investigation, including soil or groundwater sampling.

This form is voluntary and any information you provide will be used strictly to evaluate the need for further site investigation. Please respond to all questions you are able to answer, in part or in whole. Please leave cells blank if an answer cannot be provided.

Your time and expertise are greatly appreciated.

Date/Time of Interview: Monday, Sept. 26 09:00	**Work Location (Installation/Building/Area):** NAS Patuxent River 504/Env		
Interviewee Name: Mr.	**Position/Job Title:** Dir. of Env. Planning & Conservation		
How many years at current position: 35	**Phone/Email:**		
1. What types of firefighting foams are currently used at the installation?	3% AFFF Select an installation	6% AFFF Select an installation	High Expansion Foam Select an installation
	Other; please list:		
2. What manufacturer's AFFF products are currently used at the installation?	3M ☐	Ansul ☐	Chemguard ☐
	Other; please list:		
3. Where are the AFFF solutions currently stored, transferred, or handled at the installation? Please describe.			
4. Is there a secondary containment in the AFFF storage area(s)?	Yes ☐	No ☐	
	Additional information:		
5. Are your automated fire suppression systems currently fitted for AFFF or have they been retrofitted for use of high expansion foam?	☐ Currently fitted for AFFF ☐ Retrofitted for use of high expansion foam		

(Question 5 continued)	Additional information:
6. Do you have an inventory of the amount of AFFF currently stored on the installation(s) or present in the automated fire suppression systems?	Yes ☐ No ☐ Additional information:
7. Can you describe the procedure for how the suppression systems are supplied with AFFF?	
8. Have there been inadvertent releases of AFFF from hangar fire suppression systems within recent years? a) If yes, provide the time frame, and the b) estimated location of the release	Yes ☐ No ☐ Year Month Select a month Location of release: Select location Additional information:
9. How are the discharges handled? (i.e. when the suppression system goes off)? Please describe.	
10. Provide a list of trucks and trailers currently carrying AFFF and where they are parked/stored? Use the "additional information" box to add more numbers or elaborate if needed.	Identify Truck/Trailer: / Location: 1. / 1. Location 2. / 2. Location 3. / 3. Location 4. / 4. Location Additional information:

11. Approximately how much AFFF (gallons) is carried/stored in the specified trucks/trailers?	Number of Gallons: 1. 2. 3. 4.
12. Are the truck(s) tested for spray patterns to make sure the equipment is working properly?	Yes ☐ No ☐ Additional information:
13. Is AFFF used during spray pattern testing or are foam distribution test kits used to eliminate AFFF waste stream?	☐ AFFF is used ☐ Foam distribution test kit is used
14. If AFFF is used during spray pattern testing, please describe the procedures used to contain and/or clean up the AFFF after release.	
15. How often are these spray tests performed?	Spray test frequency: Select one Additional information:
16. Can you provide the locations of these spray tests?	
17. Can you describe the procedure for how trucks and trailers are supplied with AFFF, and where this resupply occurs?	
18. Can you provide the procedures for how these vehicles are currently cleaned/decontaminated?	

19. When AFFF was used during a fire training exercise, how was the AFFF cleaned up and disposed of?		
20. Do you have recollection or records of AFFF being used? a) If yes, please indicate if they were used in response to the following:	Yes ☐ No ☐	
	Select one	
	Additional information:	
21. If no written records or incomplete written records are available, do you have anecdotal/verbal information and locations of spills or other emergency response incidents where AFFF was used? Please provide the approximate date, location, and a brief description of the incident(s).	1. Date Location Description	
	2. Date Location Description	
	3. Date Location Description	
	4. Date Location Description	
22. Identify all Fire-Training Areas (FTAs) which currently or historically used AFFF.	Identify FTA Location	Current/Historic?
	1. Closed taxiway	1. Historic
	2. Centerfield - Hi Power site	2. Current
	3. near Slope Helo Pads	3. Historic
	4. Location	4. Select one

23. For the FTAs identified above, please indicate: a) The years of operation or date range. b) The date when fire training at each FTA was last conducted.	Date Range: 1. 2. 3. 4.	Last Fire Training: 1. 2. 3. 4.
24. Do you have information on how many gallons of AFFF were released in these FTAs?	Number of Gallons 1. 2. 3. 4.	
25. What types of fuels/flammables were used at each FTA?	Fuel Type 1. 2. 3. 4.	
26. Was remedial action conducted at these FTAs? a) If "Yes", please describe the remedial action. b) Indicate the year remedial action was conducted, if known. c) Indicate whether or not a new FTA was constructed on top of the original FTA following remediation in the "Additional Information" section.	Yes ☐ Year No ☐ Additional Information:	
27. What are the current fire-fighting training practices at this installation? Please describe.		
28. What are the **non-FTA locations** where AFFF suppression systems are installed or AFFF/PFCs stored or used or disposed (i.e. hangars, fire stations, maintenance areas, wastewater treatment plants, metal plating facilities, AFFF ponds/lagoons, and/or aerospace, automotive, electronic facilities)	Identify Non-FTA Location (site/building number/description) 1. Location 2. Location 3. Location 4. Location	

29. Do these location(s) currently contain or have they historically contained AFFF/PFCs? a) If yes, please indicate the years/date range each location contained AFFF/PFCs.	Years or Date Range 1. Select one 2. Select one 3. Select one 4. Select one Additional information:
30. If applicable, when was the system at this **Non-FTA** converted from an AFFF to a high expansion foam? a) Indicate year of conversion.	Year of Conversion to High Expansion Foam 1. 2. 3. 4. Additional information:
31. Is there a metal plating/electroplating shop on base? a) If yes, please indicate the years of operation or date range.	Yes ☐ No ☐ Years of operation and additional information:
32. Is there anyone else or other base organization personnel that you would recommend we interview? If so, please list.	1. First Last 2. First Last 3. First Last 4. First Last

Thank you for your participation!

Appendix C
Photo Documentation

Photographic Log			
Photo #	**Date**	**Time**	**Description:**
Site Visit Photographs			
SV-1	3/20/2017	13:33	Site 14: Mounds of debris and soil
SV-2	3/20/2017	13:29	Site 14: Close-up of burned material
SV-3	3/20/2017	15:10	Site 41: Ground surface
SV-4	3/20/2017	10:19	Site 41: Collapsed storm sewer pipe
SV-5	3/21/2017	10:47	Building 103: Floor drains
SV-6	3/21/2017	07:49	Building 2385- HAZMART: Test connection valves where AFFF has been discharged
SV-7	3/22/2017	09:16	Hangar 110: Viking® trench-mounted AFFF system
SV-8	3/22/2017	08:29	Hangar 2835: AFFF concentrate storage tanks
SV-9	3/22/2017	08:30	Hangar 2835: Cannon-style AFFF system
Historical Photographs			
H-1	-	-	Demo Area: Crash trucks demonstrating fire-fighting technique with AFFF
H-2	-	-	Building 102: Firefighter spraying protein foam from a wheeled extinguisher
H-3	-	-	Building 102: Crash truck spraying (potentially) AFFF

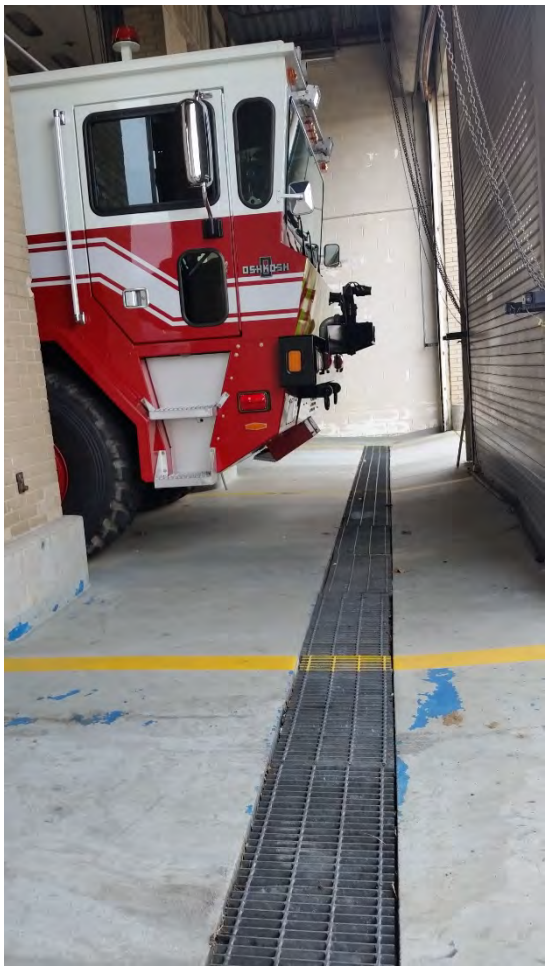
SV - Site Visit
H - Historical

SV-1. Site 14: Mounds of debris and soil

SV-2. Site 14: Close-up of burned material

SV-3. Site 41: Ground surface

SV-4. Site 41: Collapsed storm sewer pipe



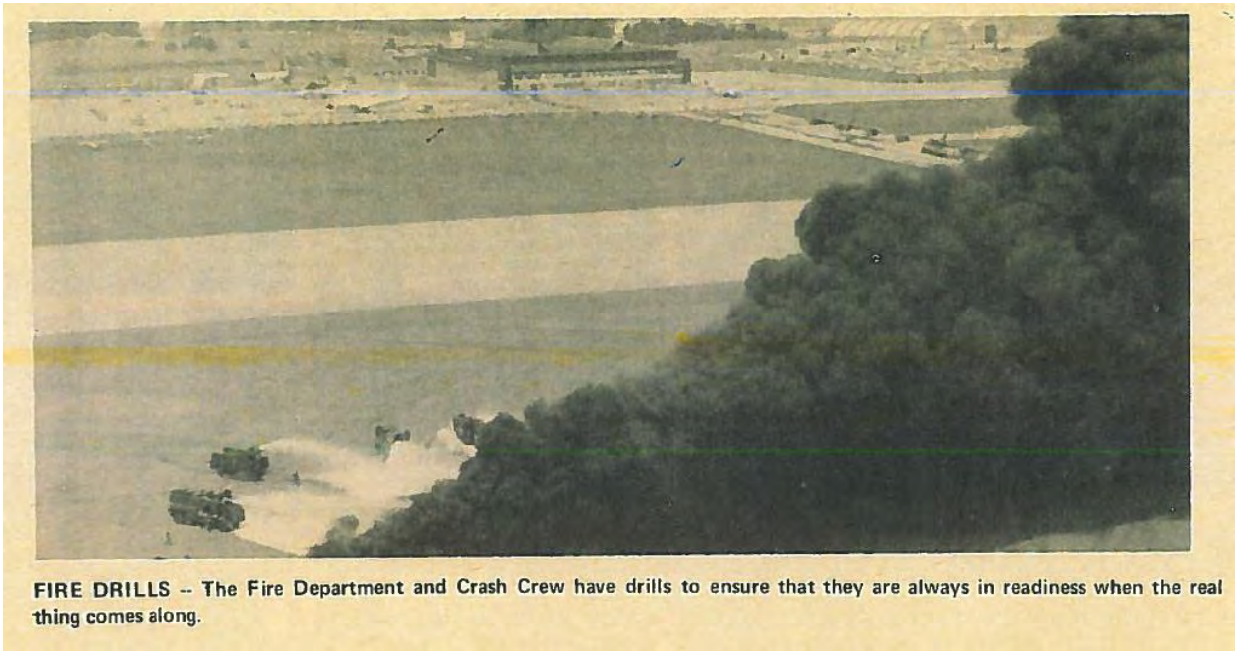
SV-5. Building 103: Floor drains

SV-6. Building 2385- HAZMART: Test connection valves where AFFF has been discharged

SV-7. Hangar 110: Viking® trench-mounted AFFF system

SV-8. Hangar 2835: AFFF concentrate storage tanks

SV-9. Hangar 2835: Cannon-style AFFF system



FIRE DRILLS -- The Fire Department and Crash Crew have drills to ensure that they are always in readiness when the real thing comes along.

H-1. Demo Area: Crash trucks demonstrating fire-fighting technique with AFFF

H-2. Building 102: Firefighter spraying protein foam from a wheeled extinguisher

H-3. Building 102: Crash truck spraying (potentially) AFFF